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Annual Report on the Health of the Army in India 1938 & 1940

Vol. 1 - 1938. Vol. 2 - 1939 (2 pts)
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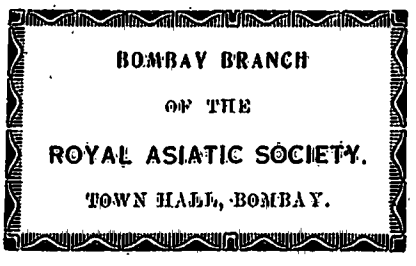

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ANNUAL REPORT

ON THE

HEALTH OF THE ARMY IN INDIA

FOR THE YEAR

1938

VOLUME I

LIBRARY

ARMY HEADQUARTERS, INDIA
Medical Directorate
New Delhi

PUBLISHED BY THE MANAGER OF PUBLICATIONS, DELHI.
PRINTED BY THE MANAGER, GOVERNMENT OF INDIA PRESS, NEW DELHI
1940
Price Rs. 3-4-0 or 5s. 3d.

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ARMY HEADQUARTERS, INDIA,

MEDICAL DIRECTORATE;

New Delhi, the 29th November 1939.

SIR,

I have the honour to submit the accompanying report on the Health of the Army in India for the year 1938. This Report is for the first time being submitted separately in its present form as a purely military report instead of being published as Volume II of the Annual Report of the Public Health Commissioner with the Government of India. Originally Volume II contained details which concerned civilian institutions; but of recent years the contents have been purely concerned with the Army in India, and as such can be more conveniently produced as a military report.

The Health of the Army can be regarded on the whole as distinctly satisfactory. Sick rates are tending to stabilise at a satisfactory level; the rate for British Troops at 603·7 per 1,000 is not however quite so low as in the previous year while that for Indian Troops at 421·8 per 1,000 is less than any for the past 8 years. Invaliding has decreased slightly for British and increased very slightly over last year for Indian troops. The rate for the latter is however below any other year for 14 years.

On the Frontier although "Peace reigned officially", troops were constantly out on columns or road protection duties, but the health of the troops remained satisfactory throughout the period.

In addition to the organised campaign that is waged yearly against malarial infection, similar efforts are now being directed by "Spraying campaigns" to control the incidence of Sandfly fever. The results have been satisfactory.

In a year in which cholera assumed epidemic proportions over a great part of India Troops were so well protected that only one small outbreak occurred.

A wide and ever increasing sphere of activity for the health of troops in India has been that of Maternity and child-welfare which flourishes actively in military cantonments and produces beneficial results.

I have the honour to be,

Sir,

Your obedient servant,

GEO. G. TABUTEAU,

Major-General,

Director of Medical Services in India.

The Secretary,

Defence Department (Army Branch),

Government of India.

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ABBREVIATIONS.

A.	Admissions.
A. D. H.	Assistant Director of Hygiene.
A. D. P.	Assistant Director of Pathology.
Av. c. s.	Average constantly sick.
A. H. Q.	Army Headquarters.
B. M. H.	British Military Hospital.
B. Os.	British Officers.
B. O. Rs.	British Other Ranks.
C.	Cases.
C. M. %	Case mortality per cent.
D.	Deaths.
D. A. D. P.	Deputy Assistant Director of Pathology.
D. A. D. H.	Deputy Assistant Director of Hygiene.
D. A. H.	Disordered action of the heart.
G. S. W.	Gun-shot wound.
I. O. Rs.	Indian Other Ranks.
M. Os.	Medical Officers.
N. C. Os.	Non-Commissioned Officers.
O. C.	Officer Commanding.
P.	Primary.
P. A.	Per annum.
P. M.	*Per mille.*
P. U. O.	Pyroxia of uncertain origin.
R.	Revaccinations.
U. K.	United Kingdom.
V. D.	Venereal diseases.
V. D. H.	Valvular diseases of the heart.
%	Per cent.

Annual Report on the Health of the Army in India for the year 1938.

VOLUME I.

SECTION I.

ON THE HEALTH OF THE BRITISH ARMY IN INDIA.

TABLE No. 1.

General health statistics of the British Army in India during the year 1938.

	Ratios per 1,000 of strength.				
	Admissions.	Deaths.	Invalids sent home.	Invalids discharged from service.	Constantly sick.
Officers	428·9	5·63	15·95	...	13·86
Other Ranks	603·7	2·78	9·35	...	27·61
Members of Nursing Service.	408·1	5·65	22·59	...	16·59
Other Ranks' wives	311·8	3·84	9·99	...	10·64
" " " —confinement	213·7	0·26	...	...	8·17
" " Children	353·4	9·75	2·74	...	11 57
Royal Air Force	416·3	5·77	10·11	...	17·44
Royal Navy	75	2	...	...	4·49
Royal Indian Marine	3	...	...	...	0·27
R. A. F. Women and Children.	69	6	...	...	1·97
R. A. F. Women—confinement.	31	...	...	...	1·21
Others :					
Men	372	10	2	..	13·62
Women	294	3	11	...	7·70
Women confinement.	125	...	...	...	4·35
Children	187	9	...	...	4·47

N. B.—The figures below the horizontal line represent actuals.

1. General.

The ratios per 1,000 for admissions, deaths and invaliding for officers and other ranks for the quinquennial periods from 1910 exclusive of the years of the great war and for the last four years separately are given below for purposes of comparison of the general health over the past 30 years.

TABLE No. 2.

Comparative Table—General sickness of Officers and Other Ranks.

Periods.	Ratio per 1,000.					
	Admissions.		Deaths.		Invalids.	
	Officers.	Other Ranks.	Officers.	Other Ranks.	Officers.	Other Ranks.
1910—14	567·5	567·2	5·14	4·36	16·30	7·03
1920—24	676·7	791·9	6·71	5·24	20·99	18·91
1925—29	589·9	619·4	5·25	2·90	17·44	13·50
1930—34	428·6	604·7	6·69	2·64	20·09	8·88
1935	470·1	567·1	6·74	2·55	24·25	6·90
1936	428·8	582·1	6·17	2·48	22·92	10·99
1937	421·4	567·8	3·41	2·15	18·00	10·97
1938	428·9	603·7	5·63	2·78	15·95	9·35

It will be noted that for admissions the rate for other ranks is tending to become constant at a figure approaching the pre-war level while that for officers is definitely lower. The death rate for B. O. Rs. is half that of the pre-war rate while that for officers remains variable.

Invaliding on the other hand shows little downward tendency, a fact probably due in part to the increased facilities for rapid transfer of serious cases for further treatment at home and in part to the rising standards of fitness required in our specialised modern army.

2. Officers.

Admissions show a rise of approximately 7 per 1,000 the rate per 1,000 of strength admitted to hospital being 428·9 during the year as compared with 421·4 in 1937.

The principal causes of sickness were :—

TABLE No. 3.

	Per 1,000.
Malaria	36·6
Dysentery	32·8
Cellulitis	31·0
Diarrhœa	25·3
Sandfly fever	21·6
Jaundice catarrhal	20·2
Tonsillitis	15·5
Fractures	13·6
Appendicitis	11·3
Influenza	10·8
Contusions	9·4
Common cold	7·5
Sinusitis	7·0
Concussions	6·6

Malaria has reverted to the position of the principal cause of sickness. With an increase of 24 cases and the insect borne group gives a combined figure of 58 per 1,000.

The dysentery-diarrhœa group is however practically the same.

These two groups of preventable diseases cause a large proportion of inefficiency amongst officers.

Respiratory diseases have satisfactorily decreased. But Catarrhal Jaundice and Appendicitis, the latter with an increase of 6 cases, continue to form a very definite cause of sickness amongst officers. Injuries with subsequent inflammation continue to take their toll.

The death rate was 5·63 per 1,000 compared with 3·41 per 1,000 in 1937.

The causes of deaths were injuries (other than G. S. W.) 4 cases, Pneumonia lobar 3, G. S. Wound 1, and Acute Poliomyelitis, P. U. O., Uræmia, Nephritis each one case.

The average constantly sick in hospital was 13·86 per 1,000 of strength as compared with 13·64 in the previous year.

527·9 per 1,000 of the strength were treated as out-patients.

TABLE No. 4.

Comparative table for sickness of officers over 10 years.

	Ratios per 1,000.		
	Admissions.	Deaths.	Invaliding.
1929	415·9	7·10	14·20
1930	392·3	5·95	21·69
1931	420·4	7·76	17·68
1932	463·2	6·54	27·45
1933	437·8	6·37	17·83
1934	429·2	6·83	15·78
1935	470·1	6·74	24·25
1936	428·8	6·17	22·92
1937	421·4	3·41	18·00
1938	428·9	5·63	15·95

3. Soldiers.

Inspite of an actual reduction of almost 900 admissions to hospital during the year the admission ratio per 1,000 has been 603·7 as compared with 567·8 in 1937 and 580·5 in 1913, a rise of 36 per 1,000 for the rate on the year.

The principal causes of admission to hospital showing the increase or decrease compared with the previous year were :—

TABLE No. 5.

Comparative Table of diseases.

	1937.	1938.	Increase or decrease.
Malaria	44·5	50·4	+5·9
Cellulitis	41·3	45·2	+3·9
Tonsillitis	28·7	33·7	+5·0
Gonorrhœa	28·4	28·0	—0·4
Dysentery	25·5	26·8	+1·3
Sandfly fever	24·6	24·8	+0·2
Influenza	16·4	13·2	—3·2
Bronchitis	16·3	17·2	+0·9
Diarrhœa	16·1	18·0	+1·9
Sprain and strains	15·8	18·1	+2·3
Fractures	13·6	13·8	+0·2
Common cold	13·6	11·8	—1·8
Dengue	12·2	3·9	—8·3
Contusions	11·9	12·2	+0·3
Impetigo contagiosa	9·9	12·4	+2·5
Synovitis	9·6	7·9	—1·7
Tinea	8·2	11·7	+3·5
Pharyngitis	8·0	10·3	+2·3
Boils	7·3	7·7	+0·4
Appendicitis	7·0	7·6	+0·6
Jaundice catarrhal	6·2	5·9	—0·3
Constipation	5·8	7·3	+1·5
Syphilis	5·8	7·6	+1·8
Coryza	5·7	6·6	+0·9
Soft chancre	5·7	7·9	+2·2
Gastritis	5·4	7·6	+2·2
Wounds	4·9	6·1	+1·2
Urethritis	4·6	4·2	—0·4
Headache	3·2	4·8	+1·6
Otitis Externa	4·2	4·9	+0·7
Otitis Media	3·4	2·9	—0·5

Malaria continues to hold its place as the principal single disease and shows an increase of 6 per 1,000 although there is hardly any increase in actual admissions for the disease.

The insect borne group of diseases however shows a decrease of 2 per 1,000 in rate and nearly 400 cases in actuals, the reduction being mainly in dengue, but also slightly in Sandfly fever for which 100 less cases were admitted during the year.

The venereal group of diseases with an increase of nearly 4 per 1,000 in the rate actually shows a slight reduction in the numbers admitted for the whole group. Unfortunately this is confined to the cases of gonorrhœa whereas both Syphilis and Soft chancre cases have been on the increase.

Three Diphtheria " Carriers " were admitted to hospital.

The death rate was 2·78 per 1,000 of the strength compared with 2·15 in 1937, *viz.* a rise of 0·6 per 1,000 although there was a reduction of nearly 20 in the actual numbers.

The chief causes of death were :—

Infectious diseases	0·58
Local injuries (including 9 Gunshot Wounds)	0·58
General injuries	0·49
Pneumonia	0·30
Digestive diseases	0·28
Circulatory diseases	0·09

Invaliding shows a satisfactory reduction, the rate being 9·35 per 1,000 of strength sent home as invalids compared with 10·97 of the previous year the actual numbers being nearly 120 less.

The principal causes of invaliding to the United Kingdom were :—

TABLE No. 6.

Invaliding, British Troops.

Pulmonary tuberculosis	1·18
Mental diseases other than schizophrenia	1·09
Injuries other than fractures	0·74
Diseases of joints	0·60
Schizophrenia	0·42
Diseases of bronchi and bronchioles	0·28
Fractures	0·28
Epilepsy	0·26
Diseases of the urinary organs	0·26
Rheumatic fever	0·21
Disordered action of the heart	0·19
Tuberculosis other than pulmonary	0·19
Valvular diseases of the heart	0·14
Deformities of limbs	0·09

The average number constantly sick in hospital was 27·61 per 1,000 of the strength, compared with 27·02 per 1,000 in 1937, although the average inefficiency was nearly 100 less.

The diseases chiefly responsible were :—

TABLE No. 7.

Average constantly sick.

Gonorrhœa	3·11
Malaria	2·15
Cellulitis	1·47
Dysentery	1·26
Fractures	0·99
Tonsillitis	0·78
Soft chancre	0·73
Syphilis	0·67
Bronchitis	0·63
Impetigo contagiosa	0·57
Sprain and strain	0·54
Appendicitis	0·52
Sandfly fever	0·47
Diarrhœa	0·43
Influenza	0·37
Synovitis	0·33
Jaundice catarrhal	0·33
Contusions	0·33
Pulmonary tuberculosis	0·31
Pneumonia	0·30
Gastritis acute	0·29

Out-patients.—1604·9 per 1,000 of the strength were treated as out-patients. The average daily number under treatment was 24·66 per 1,000.

The combined ratio of constantly sick in hospital and under treatment as out-patients was 52·27 per 1,000 of the strength, compared with 50·80 in 1937.

The actual loss to the Army in India in working days was 822,195 days compared with 878,997 in 1937.

The seasonal admission rates for certain disease groups and the admission and death ratios per 1,000 of the strength for all causes and certain important diseases for stations with a strength of 1,000 and upwards compared with all India, are shown in the following tables :—

TABLE No. 8.

Monthly incidence of admissions, all causes, and of the principal diseases.

Ratias per 1,000.

Month.	All causes.	Malaria.	Dysentery Diarrhœa Group.	Minor Septic.	Local injuries.	Venereal.
January	44·7	1·5	1·6	4·7	5·4	5·3
February	35·7	1·1	1·9	3·7	4·6	3·5
March	44·2	1·6	3·7	4·1	5·7	3·0
April	49·7	2·9	6·3	4·0	5·9	3·4
May	53·2	3·5	4·6	4·2	5·2	3·0
June	56·4	4·4	4·7	5·2	5·5	2·6
July	63·4	4·8	6·3	6·3	5·8	3·2
August	59·6	6·6	5·0	5·3	5·3	3·5
September	51·7	7·1	2·2	4·7	4·6	3·9
October	55·3	7·3	2·7	5·3	5·5	4·3
November	50·0	7·9	3·0	4·5	5·4	3·9
December	41·9	2·4	1·7	4·8	5·5	3·6

TABLE No. 9.

Table showing total admissions and deaths ratios per 1,000 of the strength for all causes and certain important diseases for the larger stations compared with All-India.

	Stations with total admission ratios, all causes, higher than All-India.								All-India.	Stations with total admission ratios, all causes, lower than All-India.				
	Quetta.	Poona.	Delhi.	Mhow.	Lucknow.	Peshawar.	Rawalpindi.	Trimulgherry.		Meerut.	Karachi.	Sialkot.	Ranikhet.	Jubbulpore.
All causes :—														
Admissions	688·9	679·2	653·4	644·9	627·8	622·0	617·1	612·1	603·7	592·0	568·9	566·6	542·5	504·7
Deaths	2·44	2·73	1·99	2·93	2·99	4·24	0·98	1·83	2·78	0·65	4·11	2·96	2·96	2·36
Av. C. Sick	27·80	41·74	29·46	30·14	34·83	28·36	25·70	32·56	27·61	33·97	34·79	22·25	35·24	26·02
	Analysis of the above total admission rates,—									Analysis of the above total admission rates,—				
Malaria :—														
Admissions	65·1	72·0	117·5	154·1	4·8	40·7	102·9	44·8	50·4	41·5	42·2	3·9	10·9	63·0
Deaths	...	...	...	...	...	...	...	...	0·07	...	...	...	...	...
Sandfly fever :—														
Admissions	114·8	...	3·0	3·9	1·2	129·7	65·9	7·3	24·8	2·6	14·7	29·6	...	...
Deaths	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Enteric Group of Fevers :—														
Admissions	...	2·2	...	...	0·6	0·8	...	0·5	0·9	0·6	...	1·0	2·0	...
Deaths	...	...	...	...	...	0·85	...	...	0·12	...	...	...	...	...
Dysentery :—														
Admissions	87·5	27·8	30·9	21·5	44·9	19·5	14·3	26·5	26·8	33·0	46·9	29·6	32·6	22·8
Deaths	...	...	...	...	...	...	...	...	0·05	...	...	0·99	...	...
Diarrhœa :—														
Admissions	32·6	14·2	14·9	7·8	16·2	19·5	19·2	20·6	18·0	44·7	22·9	10·9	21·7	13·4
Deaths	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Influenza :—														
Admissions	1·6	22·9	1·0	...	18·6	8·5	18·2	10·5	13·2	44·7	...	...	29·6	18·9
Deaths	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pneumonia Lobar and Lobular :—														
Admissions	0·8	1·6	8·0	1·0	4·2	3·4	1·5	3·7	3·3	0·6	1·2	5·9	4·0	3·1
Deaths	0·81	...	...	...	0·60	...	...	...	0·30	...	...	...	0·99	...
Minor Septic Diseases :—														
Admissions	39·9	64·4	68·7	52·7	53·9	30·5	37·9	65·4	59·2	71·9	31·7	60·2	55·3	36 2
Deaths	...	...	...	...	...	0·85	...	...	0·05	...	...	0·99	...	...
Venereal Diseases :—														
Admissions	52·1	41·5	36·9	23·4	54·5	14·4	42·3	75·5	45·0	27·8	62·2	33·6	19·8	55·9
Deaths	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Local Injuries :—														
Admissions	67·6	80·2	48·8	69·3	60·4	50·8	50·2	70·9	62·7	82·3	41·1	73·1	48·4	67·7
Deaths	0·81	0·55	1·00	...	...	0·85	...	...	0·60	...	...	0·99	...	1·57
Heat Stroke : —														
Admissions	...	...	...	...	1·8	1·7	0·5	...	0·5	0·6	0·6	...	...	...
Deaths	...	...	...	...	...	...	0·49	...	0·14	...	0·59	...	...	...
Heat Exhaustion :—														
Admissions	3·3	...	...	...	...	11·9	0·5	0·5	1·5	0·6	...	...	...	...
Deaths	...	...	...	...	...	...	...	...	0·12	...	...	...	...	...

PRINCIPAL DISEASES AFFECTING THE BRITISH ARMY.

4. Summary of Interesting features of the year.

(*a*) Malaria remains at a most satisfactorily low level inspite of the aftermath of the 1937 Frontier operations.

(*b*) Although officially there were no operations in progress, war conditions prevailed in Waziristan throughout the year and yet admission rates were remarkably small.

(*c*) Cholera was epidemic in many parts of the country, but the incidence amongst military personnel, except for one restricted outbreak, was negligible. There were only one British case and 42 Indian cases.

(*d*) The Enteric Group of fevers which are endemic throughout the country and in places epidemic, have been now reduced to less than 1 per 1,000 over the whole year both for British and Indian troops.

(*e*) The Dysentery-Diarrhœa group for which there are no specific preventive measures shows no signs of reduction.

(*f*) Sandfly fever is at last showing signs that effective preventive measures can be employed. The most satisfactory measure is that of Spraying.

(*g*) Of Respiratory diseases there was no epidemic and the incidence tends to remain level, but that of Tuberculosis has decreased.

5. Factors which may have affected the incidence of disease amongst troops.

(*a*) *Climatic conditions.*—As a whole rainfall was only in excess in eastern India and the Bombay Deccan ; defective in the rest of the country, but markedly defective in the Punjab, Sind and Rajputana.

In the winter and spring rain was excessive in southern and ample in northern India ; but in defect in central and Deccan districts.

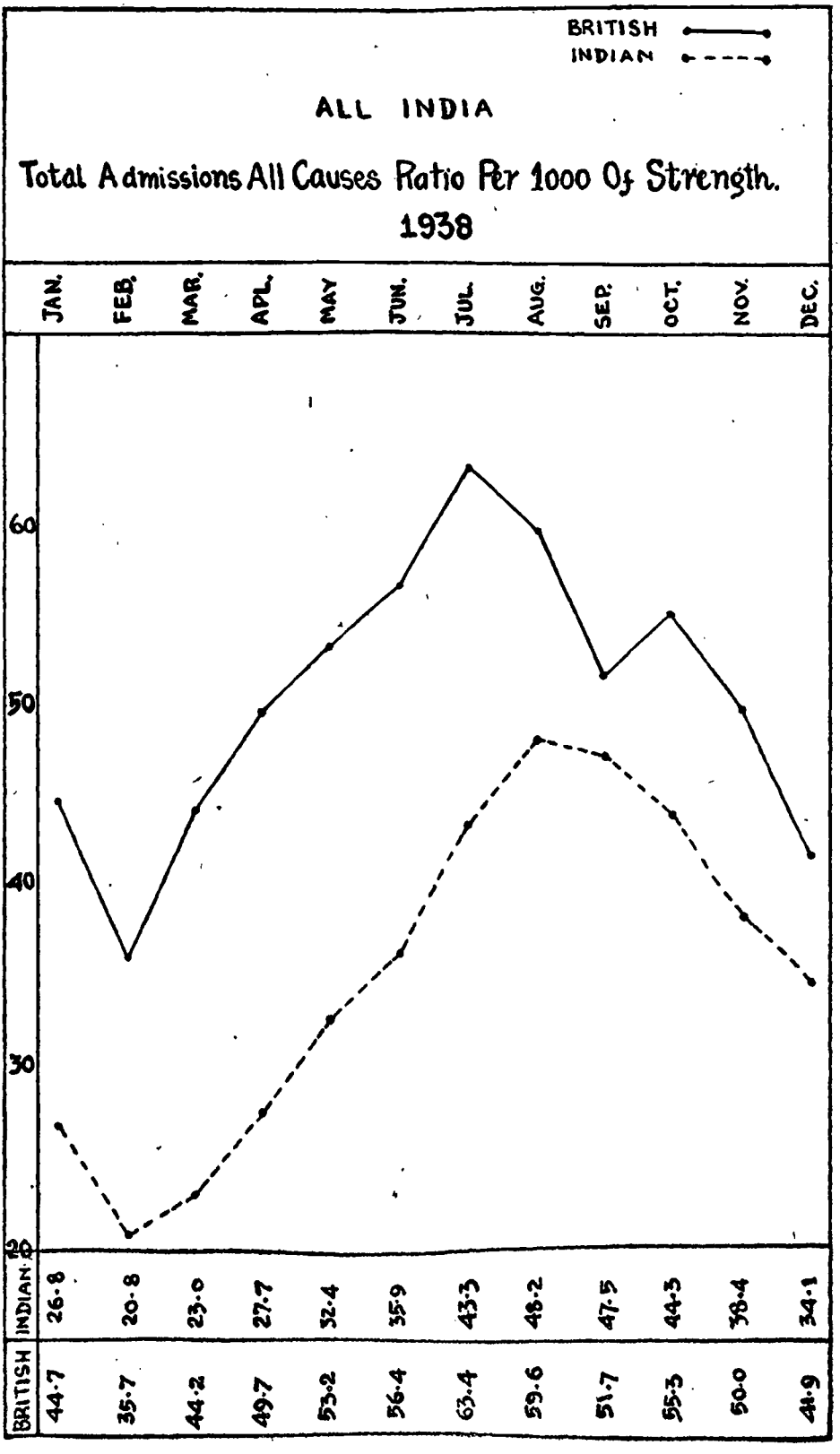
Mean temperatures were high in the south. In the north-west after a pronounced cold spell in the latter half of March and early April, markedly high temperatures ensued in May. These conditions would favour a decrease in fly-breeding but excess sandfly prevalence in the north and mosquitoes in the south and east.

The monsoon was defective over the west and north, particularly in the Delhi-Lahore area, where famine conditions later supervened with temperatures above normal, and average to excessive in the east.

The autumn was dry and warm with a hot spell of 10 degrees above normal in the north which persisted into late November, being terminated by a cold snap on the 27th of that month ; conditions definitely favourable to a somewhat reduced but very prolonged malarial and sandfly infective period.

(*b*) *Seasonal incidence of main diseases.*—The main diseases have followed their normal fluctuations with one or two exceptions. Malaria was prolonged into the autumn in northern India due to the late warmth. Sandfly fever also showed a prolonged season. The fly borne groups of dysentery, diarrhœa and enteritis were definitely associated with the normal fly seasons. Respiratory diseases including Cerebro-spinal fever were associated with colder climatic changes and the rise in humidity. But the predominance of pneumonia in the hot weather was definite. Heat stroke and heat exhaustion were increased by high summer temperatures combined with high relative humidity.

The component of all these, that is the curve of incidence, is most simply illustrated by the graph for the year for all sickness of British and Indian troops.


BRITISH
INDIAN
ALL INDIA
Total Admissions All Causes Ratio Per 1000 Of Strength.
1938
JAN.
FEB.
MAR.
APL.
MAY
JUN.
JUL.
AUG.
SEP.
OCT.
NOV.
DEC.
60
50
40
30
20
BRITISH 44·7 35·7 44·2 49·7 53·2 56·4 63·4 59·6 51·7 55·3 50·0 41·9
INDIAN 26·8 20·8 23·0 27·7 32·4 35·9 43·3 48·2 47·5 44·3 38·4 34·1

(c) *Health of civil communities.—Cholera.*—In the first quarter of the year the incidence was already high in Bengal, low in central India and absent in the north and west. From March to July there was a marked rise in cholera incidence to four times any normal incidence in every province except Ajmere-Merwara and this extended onwards to the end of the year in southern parts.

The cause was mainly wide dissemination following two largely attended Hindu festivals, the Kumbh Melas of Hardwar and Brindaban, which lasted respectively from the 1st February to the end of April and of March. One million and three hundred thousand persons attended in a single day on the principal day of each fair.

From these centres infection spread explosively in all directions, extending from eastern Bengal to Tribal territory on the north-west frontier, where several of the followers of the Faquir of Ipi succumbed to the disease.

Small pox appears to have had an average incidence throughout the country except in Northern Command, where there were several local epidemics.

Plague.—The downward trend continues and only certain areas of the Eastern Command appear to have been seriously affected.

Dysentary and Diarrhœa.—The heavy toll of these preventable diseases continues. The mortality is actually greater year by year than that from cholera, while the morbidity must run into collosal figures and fully accounts for the vast reservoir of infection which surrounds our cantonments. The first two quarters of the year have the smallest incidence.

Respiratory diseases.—The figures for 1938 exceed the decennial average and the mortality from pulmonary tuberculosis and pneumonia together account for 65 per cent. of deaths from this group.

Malaria is noted as having been prolonged in certain areas very late into the autumn. In the civilian population of the Mhow district the incidence and virulence of malaria was the worst known for 15 years owing to prolonged and excessive rainfall and malaria was excessive in parts of Eastern and Southern Commands.

(*d*) *War and movements of troops.*—In Waziristan, though there was no official war, peace was more honoured in the breach than in the observance and there were unceasing columns moving out on " light scale ", often bivouacing where the fight ended, without mosquito nets and with limited supplies of fresh foods. Road protection duties were carried through between Kohat and Bannu in the very hottest season, and yet the health of troops remained excellent. In Eastern Command small detachments of British and Indian troops were out for short spells in the autumn.

Infection of troops with malaria and dysentery at Rest camps and on journeys was particularly noticed on several occasions. Measures have been called for to prevent recurrence as far as possible.

(*e*) *The effects of adequate modern treatment or preventive medicine.*—The reduction in the admissions for malaria, particularly of relapse cases due to our effective methods of treatment, the effects of T. A. B. inoculation on the military incidence of enteric fevers, and the relative absence of military cases of small pox and cholera in the midst of civilian epidemics all indicate the efficiency of modern preventive medicine.

The following note by an experienced officer is worth quoting :—

" Perusal of the clinical records of the cases placed on the dangerously ill list and of cases of outstanding interest disclose that the standard of professional ability displayed by medical officers and nursing staffs of hospitals is of a very high order. It also helps one to realise that today the combined recourses of the medical services of the Army in India place at the disposal of the soldier and his family and the sepoy and his family (for them the work is only now commencing) a proficiency in treatment and care equal, bearing in mind the physical standard of the population and the incidence of disease to which they are liable, to the voluntary hospital in the United Kingdom and only at the call of the very wealthy in civil life. Statistics speak for the high degree of preventive medicine attained ".

6. Malaria.

The incidence during 1938 has been definitely higher than that of 1937 which was the lowest figure recorded for troops in India ; but it is even now lower than that of any other previous year and is half of that occurring ten years ago. The increase for all India which is 6 per 1,000 is due entirely to the rise in admissions for relapses, the fresh cases remaining exactly the same. The majority of the increase in relapses is attributed directly to the return of infected troops from Waziristan, and may therefore be regarded as an aftermath of the Waziristan operation of the previous year.

But there have been total increases in other Commands which are very largely off set by a spectacular reduction in Western Independent District (Western Command).

TABLE No. 10.

Malarial incidence over past 10 years.

(Ratios per 1,000).

	British.	Indian.
1913	125·5	100·4
1919	217·8	145·6
1929	116·0	175·3
1930	118·4	153·4
1931	112·5	149·4
1932	84·1	145·0
1933	103·3	212·2
1934	67·5	156·5
1935	56·1	125·9
1936	58·0	123·1
1937	44·5	97·9
1938	50·4	109·6

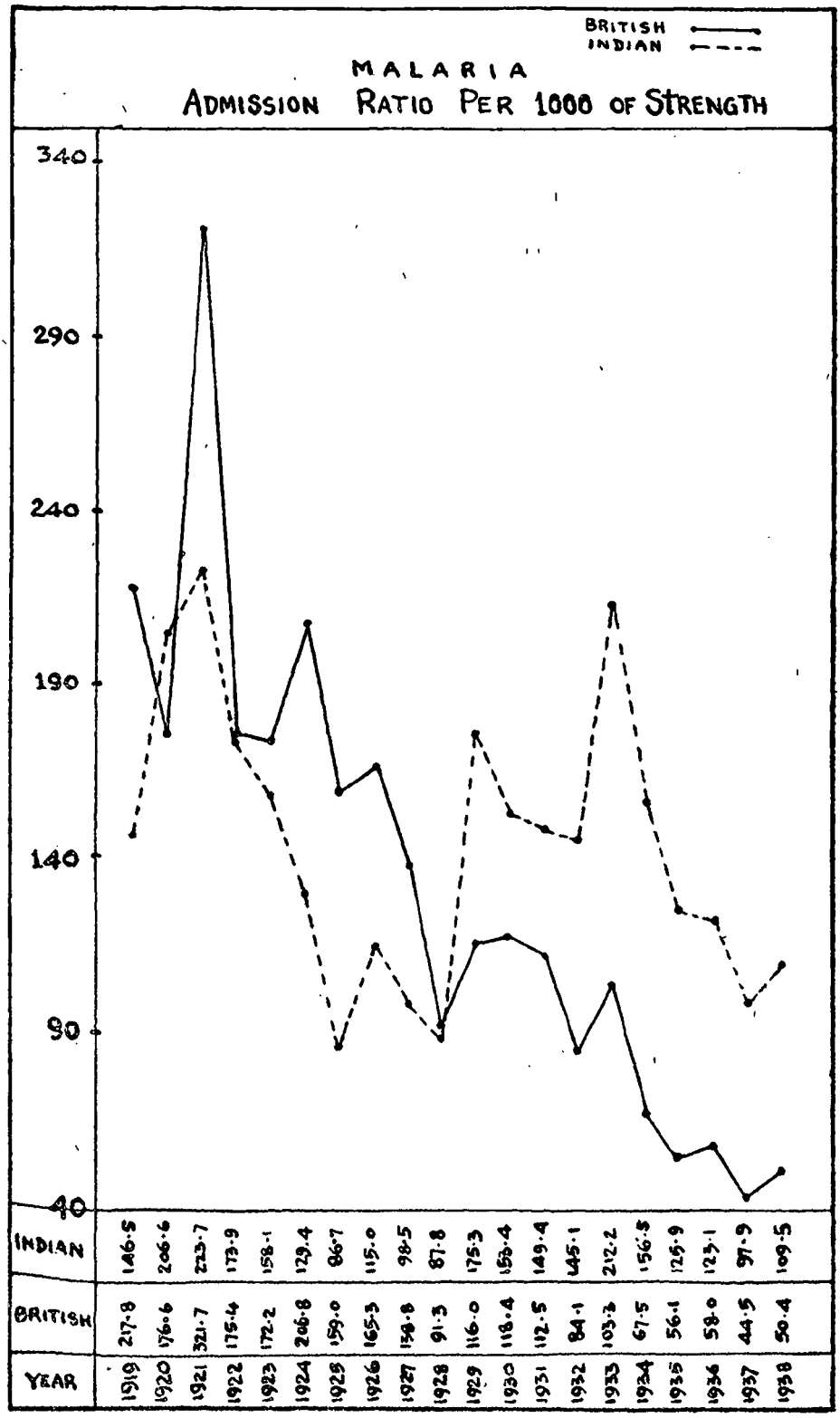
In every malarious country there are three main factors which govern the incidence of malaria amongst troops :—

(*a*) annual variations in climate, some years being peculiarly favourable, others not. In a terrain the size of India many local variations are likely to occur which affect the issue. The relatively dry summer and autumn of the north and west, noted in paragraph 4 (*a*), were in favour of the low incidence recorded later in Northern and Western Commands ; but the prolongation of the warm weather into the late autumn definitely caused a shift of the peak of fresh infections to a late period in the year instead of the normal peak in August-September.

(*b*) the efficiency of our anti-mosquito measures, which may be helped or hindered by climate, by the amount of funds available and by operations or any abnormal movements.

(*c*) the efficiency of our malarial treatment.

That the reductions noted in Table No. 10 are not fortuitous and wholly dependent on favourable conditions is shown more clearly in the graph below which covers a period of 20 years and includes bad climatic years (1933) and several years of frontier operations.



YEAR	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
BRITISH	217·9	176·6	321·7	175·4	172·2	246·8	159·0	165·3	134·8	91·3	116·0	118·4	112·5	84·1	103·3	67·5	56·1	58·0	44·5	50·4
INDIAN	146·5	206·6	223·7	173·9	158·1	129·4	86·7	115·0	98·5	87·8	175·3	155·4	149·4	145·1	212·2	156·8	126·9	123·1	97·9	109·5

There is no doubt that anti-mosquito measures in practically all cantonments have reached a very high degree of efficiency and are carried out with enthusiasm. For troops in cantonments this is certainly, in part at least, the cause of this satisfactory fall in admissions. The considerably higher incidence amongst Indian troops compared with British is in part due to the fact that the former tend to go out of the protected cantonment into infested bazaar areas and also proceed on leave away from cantonments. The value of spraying as a cheap and efficient anti-mosquito measure in cantonments and camps has been fully proved during the past 2-3 years and is considered to account for the continued reduction in admissions.

It is a noticeable feature that groups of infection in particular units are often specifically attributed, and rightly so, to some particular camp, held away from the safety of cantonments. Lahore Cantonment is a good example of the efficiency of measures now adopted within cantonments. These measures are considered later in this report.

TABLE No. 11.

British malarial cases in Lahore. The dreaded Mian Mir.

Year.	Total admissions.	Ratio per 1,000.
1924	4,370	617·70
1925	2,245	415·76
1926	2,479	384·17
1927	1,524	232·06
1928	886	117·80
1929	1,097	153·37
1930	1,320	183·25
1931	1,047	147·26
1932	679	98·27
1933	1,047	146·69
1934	371	53·36
1935	296	42·18
1936	303	44·22
1937	171	26·21
1938	114	19·67

The efficiency of Malarial treatment.—This has been greatly enhanced by the use of the newer synthatic drugs, atebrin and plasmoquine. This was referred to in the report last year. Not only is the patient cured more quickly, but his b ood is cleared of parasites more quickly and completely. This not only reduces the number of relapses, but also reduces the reservoir of possible infections in the barrack area. British troops demonstrate this more clearly than Indian troops who frequent infected bazaars and home villages.

As both these drugs are of foreign manufacture. it is high time that manufacturing firms within the Empire should take up the production of similarly effective drugs. (This was written before the outbreak of War).

Amongst the troops who were engaged in the Waziristan operations 1937, there was a definite increase in relapse cases during the present year ; increases being noted amongst returned troops at Lucknow, Jhansi, Ferozepore, Hyderabad (Sind), Jhelum, and Rawalpindi . This point is also shown in the figures for relapse cases in Table No. 12 given below. This does not necessarily imply failure of the methods of treatment. The increase in the relapses in these troops is really due to the much greater opportunities for infection during the operations and difficulties in ensuring adequate treatment for every case.

During the year a circular was issued explaining the advantages and disadvantages of Quinine, atebrin and plasmoquine. In spite of the adverse criticism on the results of treatment with plasmoquine given in the Report of the Health Organisation of the League of Nations in 1933 on the work done in military hospitals in India, 1931, our methods were continued. Our results have fully justified the method and opinions now expressed are the reverse of those expressed in 1933.

The standard treatment is now as follows, though experienced medical officers are always entitled to adopt any form of treatment they may wish.

British Troops—

Atebrin 0·3 grammes daily for 7 days.

Three days interval.

Plasmoquine 0·03 grammes daily for 5 days.

Indian Troops receive only 0·02 grammes plasmoquine.

Atebrin musonate, after extensive trial in Waziristan, has been shown to give marked relief for the journey to hospital; the dose being 0·3 grammes on two successive days.

The following table gives the admissions for fresh and relapse cases by Commands over a 6-year period. The increase in fresh cases in the wetter Eastern and Southern Commands, the increase in relapse cases in Northern Command and in the All-India figure, the general reduction in admissions, both fresh and relapse over the period and the compensatory reduction in Western Independent District in the present year are clearly shown.

TABLE No. 12.

Admission ratios per 1,000.

		1933.	1934.	1935.	1936.	1937.	1938.
Northern Command	Fresh.	120·2	40·2	44·1	45·6	30·2	34·0
	Relapse.	39·6	35·6	13·2	32·8	15·3	22·0
	Total.	159·8	75·8	57·3	78·5	45·6	56·0
Eastern Command	Fresh.	43·8	33·7	31·4	30·5	14·9	19·4
	Relapse.	18·8	14·4	13·4	6·3	9·0	13·6
	Total.	62·6	48·1	44·8	36·8	23·9	33·0
Southern Command	Fresh.	48·5	41·6	38·8	36·3	34·2	43·7
	Relapse.	12·2	13·7	10·2	9·0	9·0	16·3
	Total.	60·6	55·3	48·9	45·3	43·2	60·0
Western (Ind.)Dist. Western Command	Fresh.	175·9	100·5	111·3	56·8	101·5	38·3
	Relapse.	28·1	59·9	24·8	47·1	22·0	21·0
	Total.	204·0	160·4	136·1	103·9	123·5	59·2
All-India*	Fresh.	79·1	43·3	43·1	39·2	32·6	32·6
	Relapse.	24·2	24·2	13·1	18·7	12·0	17·8
	Total.	103·3	67·5	56·1	58·0	44·5	50·4

Malarial situation in Commands.—The outstanding feature is in *Western Independent District* where the admission rate is lower than any other recorded hitherto and is less than half that of the past few years.

*1937 and 1938 do not include Burma.

TABLE No. 13.

Western Independent District
Malarial admission rate per 1,000

Year.	Rate.
1933	204·00
1934	160·47
1935	136·10
1936	103·90
1937	123·55
1938	59·20

Compare this with Quetta in previous years.

	Strength.	Admissions.	Admission Rate.
1893	2,098	2,475	1,171·12 per 1,000
1894	2,219	1,919	864·85 „
1918	3,805	1,856	490·00 „

There was a spectacular fall in fresh admissions in August and September attributed to the anti-malarial work of British and Indian units.

"The excellent work put in by all units has been more than justified by the reduction of sickness in their ranks" writes the president of the anti-malarial Committee.

Units themselves and Brigade Commanders have little doubt that the result is due to their own anti-malarial measures, although the smaller rainfall of 1938 increased the prevalence of mosquitoes in general. But there was also a decline in the civilian malaria in the Quetta area although A superpictus, the recognised carrier of the area, was shown to be sufficiently prevalent to cause ample infection. As a part of these anti-malarial measures notorious camp sites and routes to training camps have been changed.

The anti-malarial work in Quetta has been carried out by an enthusiast and under a keen Station Commander. The history of cases is most carefully recorded to determine the source of infection and possibility of relapse. The reduction in cases is largely attributed to greatly increased spraying of all barracks.

In *Northern Command* the malarial admission rate drops for the second year in succession below first place in the list of commonest diseases and, although the admission rate is nearly 11 per 1,000 more than in the war year of 1937, it is the second lowest rate recorded in at least 14 years.

The monthly graph of incidence was definitely abnormal. The rise commenced in April but the peak was in November, a most unnatural feature, due to the warm weather.

The increase is mainly due to relapse cases and these have been attributed to Waziristan, 1937, infection. This was so at Jhelum and Rawalpindi; while at Ferozepore a batch of 17 cases, admitted immediately after arrival, appeared to be definitely due to infection at Bannu Rest camp.

In 14 years the admission rate has fallen steadily from 291 per 1,000 to 45 and 56 per 1,000 respectively in 1937 and 1938.

In *Southern Command* the continuous decrease of the past 4 years has been broken by an increase in which all districts participated. Malaria has been on the increase each year lately at Mhow [see paragraph 5 (*c*)] and Kamptee, and a large increase at Ahmednagar is also stated to be due to excessive rainfall.

Secunderabad, a practically non-malarious station, has shown a large increase due to the British Regiment who produced 90 out of the 98 cases as a result of infection in Waziristan.

In *Eastern Command*, where excess rainfall was noted, all districts show an increase. Delhi Brigade Area shows the high rate of 117·5 per 1,000 the greater part of this being attributed to relapses in the British Regiment who returned from Waziristan, having been infected at Damdil. An increase in Meerut District is also noted attributed to the practice of allowing men from the hill station of Chakrata to go on leave to Kalsi Camp which lies in the foot hills (terai) ; an incongruous procedure for troops placed in " cold storage " and which, if allowed, requires the strictest antimalarial precautions.

In all India there were only 4 stations with strengths of over 500 in which the malarial admissions exceeded 100 per 1,000 *viz.* Lucknow 154·1 ; Delhi 117·5 ; Razmak 106·5 and Rawalpindi 102·8. Razmak is really a non-malarious station but constant columns on " Hard Scale " into the low malarious valleys account for the infections.

The types of infection by Commands over the past 3 years is shown in table No. 14 below. The small proportion diagnosed clinically from the total cases is satisfactory.

TABLE No. 14.

Comparative diagnosis of Malaria by Commands.

	Year.	Malaria.					
		B. T.	M. T.	Q. T.	Mixed.	Clinical	Total.
Northern Command	1936	1,087	172	3	11	51	1,324
	1937	486	111	3	9	27	636
	1938	625	170	..	3	9	807
Eastern Command .	1936	440	99	2	8	28	577
	1937	304	43	3	3	7	360
	1938	346	47	4	17	22	436
Southern Command.	1936	409	178	32	17	23	659
	1937	408	162	12	20	18	620
	1938	466	168	28	38	17	718
Western Command .	1936	297	23	1	7	5	333
	1937	343	134	2	6	10	495
	1938	161	30	..	2	16	209
Total . .	1936	2,233	472	38	43	107	2,893
	1937	1,541	450	20	38	62	2,111
	1938	1,598	415	32	60	64	2,170

7. Sandfly fever.

The All-India admission rate for this unpleasant and debilitating, mild fever, which exacts quite a heavy toll, has remained practically stationary for British troops and has been still further reduced for Indian troops.

The general rate would have been distinctly less in this year had not Western (Ind.) District produced 178 admissions instead of the 5 cases shown the previous year, because in Northern and Eastern Commands there was a further reduction on last year's satisfactory figures, while Southern Command showed no marked change.

TABLE No. 15

Sandfly fevers over past 10 years—Ratio per 1,000

Year.	British Troops	Indian Troops
1929	43·2	18·6
1930	49·4	12·1
1931	39·4	16·3
1932	40·9	15·2
1933	40·9	10·4
1934	36·2	8·3
1935	36·5	7·5
1936	33·8	10·6
1937	24·6	6·6
1938	24·8	4·6

In *Eastern Command* the disease has been considerably less. Lucknow District has given the highest figures, but even here there is a reduction compared with 1937.

The marked increase in Western (Independent) District has already been noted; but the Deputy Assistant Director of Hygiene in his report states that the diagnosis of this disease is somewhat subject to fashion. In 1937 there had been a tendency to diagnose the minor fevers as " common cold ".

In the present year Quetta had 121 cases, Karachi 25 and Hyderabad 12 cases of Sandfly fever. In post-earthquake-Quetta ample opportunities exist for Sandfly breeding in the 7 warmer months, while at Karachi and Hyderabad infection occurs practically all the year round.

In connection with Leishmaniasis (see paragraph 15) Government provided an expert to investigate the conditions in Quetta and a grant of Rs. 2,000 was given for anti-sandfly measures in the area. The large scale anti-mosquito spraying must also have had some effect in reducing sandfly prevalence.

In *Northern Command* the very welcome reduction shown first in 1937 has been more than maintained, the rate being 46·57 against 51·15 of 1937. Peshawar District continued its previous decrease and Lahore District is now showing good results.

TABLE No. 16

Sandfly fever in Northern Command.

Year	Admissions Ratio per 1,000	
1931	72·16	
1932	84·38	
1933	85·58	
1934	80·04	
1935	82·37	
1936	80·37	Spraying campaign was
1937	51·15	instituted in Peshawar
1938	47·57	District and taken up gradually in other Districts.

The years 1937-38 may have been peculiarly adverse to sandfly breeding, but there is no evidence that this was the cause of the reduction which has appeared since the very vigorous spraying campaign was started. The Western Independent District figures in fact show the contrary. In both these years the British troops in Landikotal, the hot bed of sandfly fever infection, were unsalted troops and a high incidence of infection might well have been anticipated. Yet the incidence here has been *one-third* that of previous years. The conclusion is reached that anti-sandfly measures must be responsible for this welcome reduction of the disease. During these two years an energetic anti-sandfly campaign has been waged under the personal encouragement of the Peshawar District Commander who took the keenest interest in all measures which could be made effective.

It is considered that the most important anti-sandfly measure adopted was that of *regular spraying of barracks.* It is easy to argue " post hoc ergo propter hoc ", but the one factor which is now present when the incidence has been reduced and was not present before is this " regular spraying of barracks."

Sandfly fever enquiry at Peshawar.—A military medical officer, appointed under the Director, The King Institute of Preventive Medicine, Guindy, has been working throughout the year on sandflies and the transmission of sandfly fever. Some useful work has been accomplished, but as yet no great progress has been achieved. The work continues.

8. Dengue

There has been a very marked reduction in the incidence compared with that of the previous year, 166 cases as compared with 644, and the present rate is less than any for at least 6 years. This is due to reductions in Eastern and Southern Commands in which the rates have been one quarter and one half respectively of those for 1937.

In Eastern Command the majority of the cases occurred in the Presidency and Assam District, but there was no repitition of the Calcutta epidemic of the previous year.

In Southern Command small epidemics were noted at Bangalore, Mhow and St. Thomas' Mount, Madras. At Bangalore an increased allotment of funds for auti-mosquito measures allowed extra anti-mosquito work to be carried through with most successful results which, it is hoped, will be continued yearly. British cases were reduced from 23 to 3 and Indian admissions from 80 to 25.

TABLE No. 17

The incidence of Dengue Fever.

Year	Admissions—Ratio per 1,000	
	British	Indian
1933	11·7	2·1
1934	6·6	2·5
1935	5·0	3·4
1936	4·7	2·5
1937	12·2	5·1
1938	3·9	1·1

Cases occurred throughout the year but the peak of the curve of incidence was in November.

	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
British . . .	11	3	5	5	3	4	7	2	15	29	57	22
Indian . . .	87	3	2	2	..	4	2	2	10	1	2	4

9. Fevers of the Typhus Group

The incidence remains much the same this year with a slight decrease for both British and Indian troops and cases have been widely scattered.

TABLE NO. 18

Incidence of Typhus Fever—Actuals

Year.	British.	Indian.	Total.
1933	23	19	42
1934	52	51	103
1935	19	45	64
1936	44	47	91
1937	29	43	72
1938	23	36	59

There were however a total of 81 cases in all, including all ranks and classes. The cases fall into two main groups : *Scrub Typhus* (Proteus OXK), the typhus of the Hills, which occurs chiefly in the autumn, and Murine Typhus (Proteus X 19), the disease of the Plains which gives nearly half of the total cases of this group (35 out of 81).

In addition the OX 2 group has increased, cases being diagnosed in each of the Commands.

Finally there remain 2 cases diagnosed as of this group but not classified by serological results under any of the three types.

The distribution of the total 81 cases recorded is shown below by Commands.

TABLE NO. 19

Regional indicence of Typhus Fever by types in 1938

Type.	Northern		Eastern		Southern		Western		Total		Grand total
	Br.	Ind.	Br.	Ind.	Br.	Ind.	Br.	Ind.	Br.	Ind.	
OXK . . .	3	6	8	7	3	..	..	..	14	13	27
X19 . . .	3	22	1	2	1	6	..	..	5	30	35
OX2 . . .	1	1	4	..	3	8	..	....	8	9	17
Unclassified . .	...	..	..	..	2	..	..	..	2	..	2
Total .	7	29	13	9	9	14	..	..	29	52	81
Total 1937 .	16	15	7	5	8	24	..	2	31	46	77

Western Command (Western Independent District) remains without any cases and the increase in the total cases diagnosed is seen to be due to Eastern and Southern Commands.

The recognition of the clinical disease and its confirmation by serological investigation is probably still far from complete, even amongst military personnel, and requires continued study. The disease is probably prevalent in the civilian population in many areas and passes unrecognised under the heading of fever or typhoid.

At Kasauli in Northern Command there was this year one definite case of Typhus of the OXK serological type from which a strain has been isolated in guinea pigs. Work has been continued on the reservoir of infection and on the transmission of OXK.

Evidence has been collected that *rats* may serve as the reservoir. Regarding transmission—the Trombiculidae present in the Simla Hills are being investigated and it may be mentioned that the breeding of these mites has now been accomplished. Transmission experiments with laboratory bred larvae and strains of Typhus maintained in guinea pigs are now being conducted.

10. Enteric Group of Fevers

The incidence of all groups of these fevers amongst troops remains at a very satisfactory figure. For British troops there has been the very slight increase of one case and one death, but for Indian troops a corresponding reduction of 3 cases and one death.

The reduction in the inefficiency and loss produced by this once devastating disease is well shown in the figures for the past 20 years. As regards Indian troops it should be realised that the accuracy of diagnosis was increased from 1926-27 and accounts for the apparent rise at that time. Amongst military personnel there are now probably relatively few real cases of the disease which are missed.

TABLE No. 20

Comparative table of incidence of Enteric Group Fevers over 20 years

(Ratios per 1000)

Year	British troops	Indian troops
1913	2·3	1·6
1919-1928 (Average 10 years)	3·3	0·9
1929	4·2	2·9
1930	3·7	2·3
1931	3·3	2·5
1932	3·4	2·2
1933	3·2	2·5
1934	1·7	1·9
1935	2·0	1·4
1936	1·5	0·6
1937	0·8	0·9
1938	0·9	0·8

Various small outbreaks of cases and the well recognised prevalence of Enteric infections amongst the civil population show the need for constant vigilence and protection of all military personnel against this group of diseases. These small epidemics are probably cases of mass infection impinging on a point of failure in our preventive armament, such as persons who have missed or possibly refused protective inoculation and exposed themselves to risk by use of extraneous sources of milk, water or foods.

In Northern and Southern Commands there was a slight increase in the admission for this group. Poona and Ahmednagar had 4 cases each amongst British troops. In Western Ind. District there were no British troops cases for the second year in succession. This immunity is definitely attributed to inoculation because such cases as have occurred were amongst officers all of whom were due for inoculation. The prevalence of cases of dysentery shows that the opportunity for infection by intestinal infections was amply present.

The relative proportions of the members of this disease group are shown below.

TABLE 21

Comparative Table of Types in the Enteric Group—Actual admissions and deaths

Years		British troops						Indian troops					
		Typhoid	Para A	Para B	Para C	Entc. Group	Total	Typhoid	Para A	Para B	Para C	Entc. Group	Total
1935	A	27	13	4	...	66	106	55	46	1	...	62	164
	D	8	...	...	...	1	9	8	3	...	...	2	13
1936	A	14	13	1	1	47	76	29	14	1	...	33	77
	D	2	...	...	...	1	3	3	...	...	...	2	5
1937	A	6	2	2	...	26	36	36	23	...	...	29	88
	D	3	...	...	...	1	4	6	1	...	...	1	8
1938	A	15	2	4	...	16	37	38	15	1	1	30	85
	D	3	...	...	...	2	5	5	...	...	...	2	7

The decrease in the Para A group noted in 1937 for British troops has been maintained and Indian troops show a similar satisfactory decrease this year. There are however indications that the Para A group may show increases for 1939. The reduction of cases remaining ungrouped over the past 4 years is satisfactory.

The seasonal incidence of the group is similar to last year ; but with a tendency to prolong into the autumn, possibly on account of the extension of the warm weather [see paragraph 5(a)]. The monthly figures indicate that some factor connected with the warm-wet months is the cause of many of such of the infections as have occurred, similarly to those for dysentery. The probable factor appears to be fly prevalence with fly borne infection of milk and foods.

TABLE No. 22

Seasonal distribution per cent of Enteric Group fevers—British and Indian Troops

Command	Number of cases	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Northern	64	9·4	6·2	3·1	...	4·7	20·8	12·5	15·6	7·8	10·9	3·1	6·2
Southern	24	8·3	4·0	12·5	...	...	12·5	20·8	8·3	8·3	4·2	8·3	12·5
Eastern	22	4·5	4·5	9·1	9·1	13·6	9·1	4·5	9·1	9·1	13·6	9·1	4·5
Western (I.) Distt.	12	...	8;3	..,	8·3	...	16·7	8·3	...	25·0	16·7	...	16·7
All India	122	7·4	5·7	5·7	2·5	4·9	16·4	12·3	9·8	9·8	10·7	4·9	8·2

The absence of infections in t he dry or hot months and relative absence in the coldest months, that is in the non-fly seasons, is strikingly shown by the figures given in this table.

The comparative effect of the Enteric fever group on British soldiers of over and under one year's service in India is shown below in Table No. 23. Last year comment was made that for the first time no cases had occurred in soldiers of under one year's service in India and the enhanced effects of the new T. A. B. vaccine now issued by the Royal Army Medical College, Millbank and the Central Research Institute, Kasauli, was credited with this achievement. This year this record has been broken and the case incidence has reverted to that of the period 1934-35.

TABLE No. 23

Effects of Enteric Group fevers on British soldiers with under one year's service in India

	Under one year					Over one year				
	Cases		Deaths		Case mortality %	Cases		Deaths		Case mortality %
	Actuals	Ratio per 1,000	Actuals	Ratio per 1,000		Actuals	Ratio per 1,000	Actuals	Ratio per 1,000	
Average for 1929—1933 .	30	2·84	7	0·68	23·84	32	0·71	3	0·08	11·24
Average for 1934—1935 .	7	0·65	2	0·18	28·57	20	0·47	4	0·11	22·50
1936 . .	6	0·62	...	...	...	8	0·19	2	0·05	25·00
1937 . .	...	...	...	...	...	6	0·15	3	0·08	50·00
1938 . .	8	1·10	2	0·27	25·00	7	0·19	1	0·03	14·30

Inoculation.—The decline to the present almost insignificant figure of the incidence of Enteric Group infections is due definitely, apart from improvements in water supplies, milk supplies, protection and care of food stuffs and possibly the reasonable standard of sanitation in cantonments, to the yearly increasing care which is given to the production of our efficient T. A. B. vaccine and to the high degree of protection obtained and the high percentage of personnel who accept this voluntary inoculation. The fact that it is voluntary necessitates constant alertness and supervision on the part of all medical officers in charge of troops and families to ensure that individuals are kept up to date in their protection and not missed by reason of being away for a time. In addition, one or two non-believers who influence others are quite capable of upsetting the efforts of medical officers to produce 100% protected personnel and such objectors cause thereby much extra work and open gaps in our defence which may well account for some of the cases. We have also those who fail to remain protected from mere forgetfulness. The following instances illustrate the need for constant vigilence.

At the Staff College, Quetta, there were two cases of officers admitted with enteric fever. Both were overdue for inoculation. In addition two of the senior staff were ill with an obscure fever thought to be enteric. Now all officers and families have to produce a certificate of inoculation and vaccination.

At Simla there was a small outbreak of Para-typhoid A amongst officers and their families concurrent with a local epidemic which took effect from the middle of June to the end of August. Three officers of Army Headquarters, two wives and one daughter of officers were the military personnel involved. In this case all except one had been inoculated at *some* time.

At Murree in the Lawrence College, a civil school at Ghora Gali, there was an explosive outbreak with 20 severe cases and 2 deaths.

For troops the following table shows the period after inoculation at which infection occurred.

TABLE No. 24

Enteric fevers—Periods after inoculation at which infection occurred

	Total enteric group of fevers			Typhoid cases bacteriologically proven		
	0—6 months Per cent	6—12 months Per cent	12—18 months Per cent	0—6 months Per cent	6—12 months Per cent	12—18 months Per cent
1929 . .	32·2	50·5	17·5	31·2	58·3	10·4
1930 . .	37·6	43·6	18·8	32·7	46·6	20·7
1931 . .	35·4	35·4	29·2	34·4	34·9	30·2
1932 . .	33·7	38·0	28·2	30·9	45·4	23·6
1933 . .	32·0	44·0	24·0	26·0	45·8	29·2
1934 . .	33·7	35·1	31·1	40·0	24·0	36·0
1935 . .	30·0	43·3	26·6	21·7	43·4	34·7
1936 . .	32·3	40·0	27·7	15·4	30·8	53·8
1937 . .	29·6	40·7	29·6	..	50·0	50·0
1938 . .	29·7	59·5	10·8	6·7	73·3	20·0

From the relation of the period after inoculation to the occurrence of the cases shown by these figures for bacteriological proven cases it became obvious that, although improvement was being obtained in the earlier months, the period after 12 months to 18 months was showing an increase in the percentages. It was decided to make a change in the procedure and the extent of T. A. B. inoculation, and this decision has been carried into effect during the year under review. The method now is to retain the double doze, 0·5 cc and 1 cc given at a ten day interval, for all primary inoculation; but all subsequent inoculations will consist only in one doze of 0·5 cc T. A. B. at 12 monthly intervals. This change was brought into action in the second half of the year and results are being carefully watched. In view of the reduction of the dose the Para A moiety may not be adequate and may require an increase in future.

TABLE No. 25

Fevers of the enteric group—Inoculation state among B. O. Rs

Group.	Ratio per 1,000		Case mortality per cent
	Cases	Deaths	
Protected	0·90	0·12	13·51
Unprotected	..	..	..

See note below Table No. 26

TABLE No. 26

Incidence of fevers of the enteric group among Protected and Unprotected officers, other ranks, women and children

		Percentage.	Admissions					Total.
			Typhoid	Para A	Para B	Para C	Enteric group	
Officers (B. S. & I. S.)	Protected .	95·86	..	2	..	..	2	4
	Unprotected	4·14	1	3	..	..	5	9
British other ranks.	Protected .	98·46	15	2	4	..	16	37
	Unprotected	1·54	..	..	..	..	..	..
Women	Protected .	95·84	1	2	..	..	1	4
	Unprotected	4·16	2	..	..	..	1	3
Children	Protected .	90·02	1	1	..	..	1	3
	Unprotected	9·98	3	2	..	..	1	6

NOTE.—The absence of cases amongst unprotected B. O. Rs. is notable but their numbers are relatively few and hygienic control of their general health is careful.

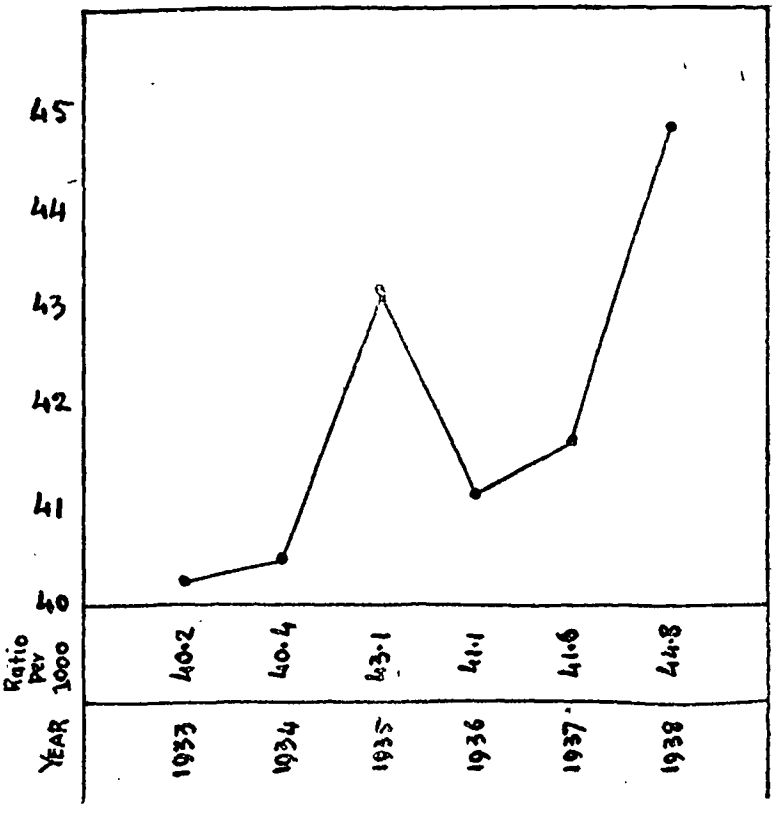
The 1·54% unprotected B. O. Rs. appear to have been exceedingly lucky. Their apparent immunity to infection may be due to old standing protection from past inoculation or to the relative protection of sanitary measures and food protection in barracks.

11. Dysentery, Diarrhoea, Colitis and Amoebic Hepatitis

A very different picture indeed is presented by this group compared with those of the previous disease groups which have been steadily reduced. In fact there is a tendency to increase rather than decrease.

For British troops this is shown by the graph for the past 6 years which gives a very distinct rise in the rates of cases admitted.

Dysentery and Diarrhoea—B. O. Rs.



That this increase is not merely a temporary wave of incidence is shown by the more extended figures given in the following table for British and Indian troops. From this it will be seen that there has actually been a steady increase for British troops and Indian troops are showing no signs of permanent reduction.

TABLE No. 27

The incidence of the Total Dysentery-Diarrhoea Group

Year	British troops	Indian troops
1913	18·5	25·9
1919	45·3	31·1
1925	24·3	20·3
1929	36·3	24·6
1930	40·5	27·7
1931	43·9	22·6
1932	38·2	21·8
1933	40·2	23·3
1934	40·4	30·2
1935	43·1	17·8
1936	40·7	17·2
1937	41·8	17·9
1938	44·8	24·7

A study of the monthly incidence of this disease group by Commands and the All India figures together with the reiterated comments of experienced Hygiene officers indicates clearly that the majority of the infections are flyborne and come from the vast reservoir of adjacent bazaars or cities in which sanitation is primitive. The monthly figures are given in the following table.

TABLE No. 28

The Seasonal incidence of the Dysentery-Diarrhoea Group

	British			Indian		
	1936	1937	1938	1936	1937	1938
January	1·4	1·7	1·6	0·6	0·8	0·6
February	1·3	1·5	1·9	0·5	0·4	0·4
March	3·2	3·3	3·7	0·6	0·8	0·7
April	5·7	6·4	6·3	1·5	1·6	2·3
May	4·3	5·0	4·6	2·0	1·8	3·1
June	3·3	2·6	4·7	1·9	1·6	2·9
July	5·1	3·5	6·3	2·0	1·9	3·8
August	4·1	5·3	5·0	2·2	2·9	3·7
September	3·2	3·6	2·2	1·6	2·1	2·3
October	3·0	2·2	2·7	1·4	1·7	1·7
November	3·1	3·7	3·0	1·4	1·7	1·9
December	2·3	2·5	1·7	1·3	1·0	1·0

All Ratios per 1,000.

In the various areas of this vast country there are naturally differences in the periods favourable to fly breeding, but the figures above indicate the two rises in case incidence which correspond with the periods at which fly prevalence is known to increase ; namely the spring period of March and April

and the moist hot period of July to the end of August. In the south where a double monsoon prevails there is often a second increase in sfly prevalence and of consequent cases of the dysentery group. This year Secunderabad surpassed itself with 103 British admissions and Poona had 76, though Southern Command as a whole showed a decrease in total admissions compared with 1937.

The relative incidence of the component diseases of this dysentery group is shown in the following table for six year period.

TABLE No. 29

The incidence of Dysentery, Diarrhoea, Colitis and Amoebic Hepatitis

Ratios per 1,000

	Dysentery.	Diarrhoea.	Colitis	Total.	Amoebic Hepatitis.	Liver Abscess.
1933 . . .	24·9	15·3	1·0	41·2	0·65	0·13
1934 . . .	25·5	14·9	0·8	41·2	0·96	0·09
1935 . . .	29·2	13·9	0·4	43·5	0·46	0·08
1936 . . .	24·6	16·5	0·9	42·1	0·29	0·04
1937 . . .	25·5	16·1	0·3	41·9	0·23	0·06
1938 . . .	26·8	18·0	0·2	45·0	0·53	0·07

In this 6 year period Colitis shows a steady reduction. This is considered to be due to the improvement in laboratory technique and improved methods of diagnosis of cases which now pass to the more definite dysentery groups.

In amoebic hepatitis and liver abscess we also have a tendency to reduction which over the longer period from 1920 has been definite.

The ratio per 1,000 of amoebic hepatitis, which unfortunately has been doubled in the present year, is still only two thirds that of 1933.

The cases of liver abscess have decreased steadily. In the seven year periods 1920-26 and 1927-1933 the average actual admissions were 30·6 and 9·8 respectively and in the last five year period only 3·4.

The steady drop in the sub-groups, amoebic hepatitis and liver abscess, is in contrast with the dysentery-diarrhoea sub-group which is undoubtedly fly-borne. This fact seems again to indicate that fly carriage may not be the main cause of spread of these amoebic infections. It was pointed out in last year's report that the extensive improvement in water supplies and the chlorination of water may well have been responsible for this, and that chlorination must have a greater effect on the cysts of E. histolytica than is generally supposed.

It is in the fly-borne dysentery-diarrhoea sub-group, in which there has been no improvement, the rates of incidence ranging steadily about 25 and 16 per 1,000 respectively over a long period of years. A study of the tables and of figures from Commands makes it clear that there has been no tendency for the incidence to be reduced over a period when malaria, sandfly fever and enteric have shown pronounced reductions. Yet dysentery and diarrhoea *are strictly preventable diseases.*

It is considered that the reason lies in the fact that, having no sound preventive inoculation against these diseases and the diseases being fly borne, the sanitation of the surroundings of our cantonments plays a predominant part in the incidence of the infections. The sanitation, " save the mark ", of bazaars, even in cantonments and particularly in any adjacent uncontrolled areas, is so bad as to pass the belief of any one who has not studied it. Open ground, nullahs and drains such as exist are freely used as latrines, latrines where they exist afford every facility for flies to obtain easy access to faecal food and the dysenteric infection. Flies can be found breeding every where, massive reservoirs of infection abound in the population and the completely insanitary habits of the bulk of the bazaar population completes the circle of infectivity from the sources of infection to the food of troops.

Under these circumstances, until the civil population is educated and the sanitation improved, the only real and possible remedy lies in the protection of food supplies of all kinds for troops, officers and families by fly proofing all places connected with food.

In Western Independent District, where there was an increase of 26 cases, Karachi had the majority in February and March while Quetta had them in June, definitely in the fly seasons. An outbreak of dysentery occurred amongst a large draft of R. A. F. men at the Transit camp at Karachi and was held to be due to faulty dish washing and the lack of fly proofing of food stores, dining rooms and kitchen annexes.

In Eastern Command, Jhansi had the highest figures for any station in the Command. This was attributed to the fly infestation caused by the municipal trenching grounds which are sited much too near cantonments. Action is being taken to try to remedy this condition. A comparison of the admissions in Jhansi with those at Agra which is relatively near, but has no closely adjacent large bazaars or trenching grounds, is of interest in this connection.

TABLE NO. 30

Dysentery and Diarrhoea at Jhansi and Agra

	Ratios per 1,000			
	Jhansi		Agra	
Year	British	Indian	British	Indian
1936	43·3	27·3	28·4	29·4
1937	91·5	28·4	22·7	6·7
1938	64·4	49·1	35·5	16·7

In Waziristan, at Razmak an epidemic started in April amongst Indian troops and spread to British, attributed to congestion in the camp and temporary disorganisation in sanitation due to a break-down of the refuse destructor and marked prevalence of flies.

The distribution of the four disease types by Commands shows that there is little variation in them from year to year.

TABLE No. 31

Dysentery by Commands for the years 1936-37-38

Command	Bacillary	Bacillary exudate	Protozoal	Clinical	Total
Northern	6·9	4·0	1·8	8·1	20·9
	8·6	3·4	1·9	7·2	21·0
	11·5	2·8	1·5	5·4	21·1
Western	12·5	5·0	2·5	15·3	35·3
	11·2	6·7	1·5	8·5	27·3
	18·7	6·0	1·7	16·2	42·5
Eastern	13·8	6·5	3·3	4·0	27·7
	15·8	4·2	3·6	5·5	29·0
	16·4	4·1	5·5	3·8	29·8
Southern	14·0	6·3	2·3	0·8	23·4
	13·5	7·0	2·8	2·3	18·5
	12·1	7·2	3·9	2·4	25·6

As regards diagnosis, the percentage of types shown below indicates clearly that a common standard of diagnostic procedure is carried out successfully in all Commands and variations are within narrow limits, clinical and exudate cases decreasing as bacteriologically proved cases increase.

TABLE No. 32

Percentage diagnosis of Dysentery Diarrhoea Group

	1935	1936	1937	1938
Dysentery Protozoal	10·3	10·8	10·4	12·7
Dysentery Bacillary (proved)	41·5	46·1	49·3	51·3
Dysentery Bacillary (exudate)	23·0	22·4	19·6	17·4
Bacillary clinical	25·3	20·7	20·7	18·5

12. Cholera

In spite of the epidemic of cholera which spread explosively over the greater part of eastern and northern India [Paragraph 5(*c*)] there was only *one* British case. This occurred in the Lucknow District, a mild case which recovered.

Energetic precautions and a very careful watch over possible sources of infection had to be taken in all Commands from eastern Bengal to the limits of the frontier in Peshawar, Kohat, Waziristan and Baluchistan. Except in a few isolated cases amongst Indian personnel these measures proved successful.

13. Diseases of the Digestive System

With an increase of nearly 200 admissions the rate per 1,000 has risen.

1936	103·1 per 1,000.
1937	99·4 per 1,000.
1938	113·6 per 1,000.

This is concomittant with the rise in the general dysentery group and as far as the cases of intestinal infection go is dependent on similar causes. Tonsillitis, which curiously is included in this group, has produced 91 more cases than last year and accounts for a large number of hospital admissions every year (1,453 cases) and is again third in the list of principal causes of admission.

Of Catarrhal Jaundice there were 256 cases this year and Gastritis produced 326 cases. Pharyngitis which also curiously is included in this list produced 444 cases.

In connection with the increase in messing allowance for the provision of suppers, which was introduced in the autumn of 1937, one medical specialist expresses fears that there may be a general increase in digestive disorders because on this account the British soldier receives an extra meat-meal and will now be eating 3 meat meals a day ! We are *quite sure* that there is little likelihood of such an untoward effect.

14. Cysticercosis

There was only one case of this distressing condition which occurred at Lahore. It was a case typical of the complete unexpectedness of the condition. The details are as follows :

> Sergeant W. Service in India 10 years. No history whatsoever of worm infection or anything abnormal. He was a patient in hospital for a traumatic ulcer of the leg. A smart and able N. C. O. He was seen by the Assistant Surgeon on duty recovering from a " Fit ".
>
> There was nothing to account for this until X-ray revealed the presence of cysticeri in leg and thigh, pelvis and skull.

Epilepsy.—There were only 11 cases of Epilepsy major invalided amongst British troops compared with 22 the previous year.

Tape worms infections.—Amongst British troops there were 121 cases of T. saginata and 4 cases of T. solium compared with 132 and 20 in 1937 and 134 and 17 in 1936.

In the present year the majority of the cases of T. saginata infection are from southern and central India. Two of the four T. solium cases were in northern India *viz.* Cambellpore and Nowshera ; the third at Bareilly ; the fourth was at Madras. Of the T. saginata cases Poona, Ahmednagar and Nasirabad had 10 cases each. The Deputy Assistant Director of Hygiene in the report of the Western (Ind.) District comments that T. saginata is very common in the Quetta area, 8 men and 3 children were admitted in Quetta for this complaint. At Karachi a piece of " measly " beef was actually issued to a unit, but was detected before use.

Amongst Indian troops there were 26 admissions with T. saginata but 7 with T. solium. In 1937 there were 24 admissions for T. saginata and 13 for T. solium and an investigation into the type and class of personnel concerned revealed the fact that infection with a particular type of worm bore no relationship to the religion of the patient, T. saginata being present in Hindus and T. solium in Mussalmans.

15. Oriental Sore

There were only 8 admissions amongst British troops but 86 from Indian troops. But the numbers under out-patient treatment are very considerable. The admissions over 5 years are shown below.

TABLE No. 33

Oriental Sore Admissions

Year	British troops	Indian troops
1934	5	103
1935	7	67
1936	34	172
1937	12	135
1938	8	86

In the endemic area of Quetta Rs. 2,000 was allotted by Government as a special anti-sandfly measure for Quetta city and surrounding areas. In 1936 the numbers of cases with oriental sore in the military and civil population became great enough to cause anxiety and under the orders of the Government of India, Dr. Smith from the Central Research Institute, Kasauli was detailed to investigate and report. This report showed that conditions were exceptionally favourable for sandfly breeding and the spread of oriental sore infections. It recommended the bricking of all the main nullahs. In the cantonment this improvement is now being carried out.

The incidence of Oriental Sore in Quetta apart from actual admissions is shown in the following table. It will be seen that the numbers have again jumped considerably.

TABLE No. 34

Incidence of Oriental Sore in Quetta Cantonment

	British troops	Indian troops and fo llowers	Total
1936	63	448	511
1937	36	165	201
1938	53	391	444

In 1938, of the 391 cases 124 I. O. Rs. and 137 Followers or 261 cases belonged to the Cavalry Regt., and of these 137 Followers 119 were syces. As far as this area is concerned there must therefore be some factor present in the horse lines which accounts for this prevalence.

In pursuance of this feature trials were made with Stomoxys Calcitrans which is abundant in the lines. Mechanical transference by this means was clearly proved by the production on volunteers of sores 5 and 6 months after the experimental bites by this fly. It should be noted however that the conditions for ample sandfly breeding in and round these lines has been almost ideal.

During the present year traps, spray guns and spraying were extensively used in every barrack and quarter of this unit. The rise in incidence is disappointing and arrangements have been made to intensify the campaign and to ensure protection and to cover of all open sores to prevent transmission to others.

16. Minor Septic and Local Injury Groups

This combined group of cellulitis and infected injuries, which are so interconnected as to be suitably regarded as one group, produces, as ever, a very high rate of temporary inefficiency. The total admissions in the present year number over 5,000 for British troops alone while Indian admissions were over 10,000. If considered as one, this group almost invariably heads the list of causes of sickness ; hospital admissions are large and barrack treatment cases even larger. From the nature of military training this must of necessity be so to a considerable extent. From the preventive aspect, active measures consist chiefly in ensuring as rapid cures as possible, for this purpose hospital admission is often the most satisfactory method, and in the maintenance of good general health by feeding.

The total inefficiency from this group for troops is best summarised in the following table.

TABLE No. 35

Minor Septic and Local Injury over the past 10 years

	British Troops			*Indian Troops*		
	Minor septic	Local Injury	Total	Minor septic	Local Injury	Total
1929	52·4	56·8	109·2	24·4	37·4	61·8
1930	52·7	58·9	111·6	25·6	38·3	63·9
1931	59·0	61·7	120·7	30·0	41·2	71·2
1932	56·2	58·5	114·7	30·4	43·7	74·1
1933	58·1	60·2	118·3	32·7	48·2	80·9
1934	57·9	62·3	120·2	17·5	49·0	66·5
1935	59·7	62·2	121·9	35·3	53·1	88·4
1936	59·5	61·8	121·3	33·4	52·6	86·0
1937	54·6	57·6	112·2	31·4	52·0	83·4
1938	59·2	62·7	121·9	33·4	58·7	92·1

Cellulitis still retains second place as a single cause of admission to hospital and in spite of a reduction of 11 cases the rate for the year has increased from 41·3 of 1937 to 45·2 this year.

Boils show a slight reduction recently.

TABLE No. 36

The indicence of Boils

	British	Indian
1936	473	696
1937	346	531
1938	333	645

Local injuries, which include sprains, abrasions, contusions and open injuries, taken as a whole accounted for over 2,500 British admissions. There were 25 deaths which is 7 more than in 1937 but 6 less than in 1936.

In Northern Command the incidence was high with an increase from 104·92 per 1,000 in 1937 to 114·03 in 1938. This was largely due to contributions from Waziristan where naturally the local conditions of a state of " peace-war " with repeated columns was very liable to cause these diseases. The general trend is however downwards and, with attention directed to treatment with elastoplast and similar dressings, hospitalization and prolonged periods under barrack treatment are definitely less. The incidence in Northern Command has been as follows.

TABLE NO. 37

Minor Septic and Local Injury Group for Northern Command.

British Troops.

	(per 1000).
1933	140·07
1934	130·50
1935	126·67
1936	121·33
1937	104·92
1938	114·03

The advent of the Sulphonamide group of drugs has also commenced to make a difference in these tiresome cases and even better results may be expected in future. They have begun to be used extensively with uniformly good results in all cases of septic skin infections and a marked shortening of the period of hospitalization. The policy has been to administer 45 grains daily for 3 days followed by 2 days rest and repeated, if necessary.

The increased salt ration which received comment in last year's report was continued. Although the advantages aimed at, the reduction of Prickly heat and Boils, have not been proved statistically, the trend of opinion is definitely in favour of this extra issue on account of the general feeling of better health which it appears to give. The effect on the advent of prickly heat is doubtful ; but the reduction in the subsequent boils, their number and severity by means of this extra salt appears much more probable. Troops certainly favour it, particularly Indian troops, and scientifically the need for an increased intake to cover the extra loss during hot weather appears to be definite.

This extra salt ration also appears to play a part, it may be an even more important part, in the ability of the body to maintain the heat regulating mechanism during high external temperatures with high humidity. This is referred to again in paragraph 24.

17. Venereal Diseases

These diseases which gave an increase of 6·1 per 1,000 the previous year, have shown a further increase this year of 3 per 1,000, though there is a slight decrease in the actual admissions. The admission rate is now 10 per 1,000 more than it was 6 years ago. The increases are from Southern Command and Western Ind. District ; Eastern and Northern Commands both show a slight decrease.

The decrease in Northern Command is not regarded as showing any real tendency to a reduction of infections, in fact 1937 and 1938 are the worst year over a ten year period. The comment is made in the annual report that :

> " There is no doubt that the main difficulty to contend with in the prevention of venereal disease in India is the lack of social amenities and amusements outside barracks, particularly female companionship ".

The introduction of the 4 year period of service abroad which has now been sanctioned may have some effect on this aspect of the problem.

In Eastern Command with its slight decrease, the Presidency and Assam District had the highest rate with Calcutta as the plague spot of the district. Special disciplinary measures which were introduced in the mid-year appear to have had an appreciable effect in reducing infections.

In Western Ind. District the increase was principally in Syphilis and Soft sore with a real fall in the incidence of Gonorrhœa. The comment is made " Has the ready availability of the Sulphonamide Group of drugs in chemists shops anything to do with this ? " It had been stated that the British battalion now in Quetta, when recently in Tientsin were known to have been buying this drug there. In Quetta two small fulminant outbreaks were traced to one brothel in a street which is entirely devoted to the same. In Karachi there was an increase of cases from 29 to 70 of Syphilis ; 45 of these came from Quetta.

In Southern Command there was a sharp rise from 14·70 per 1,000 to 50·28 per 1,000, a rise which was shared by all districts in the Command. The worst stations were Malappuram, Bombay, Madras and Secunderabad.

The worst stations for all India with their ratios per 1,000 were :

Calcutta (Alipore) . . .	108·0	Karachi.	62·2
Bombay (Colaba) . . .	95·1	Agra	56·2
Madras	90·3	Jubbulpore	55·9
Trimulgherry (Secunderabad) .	75·5	Lucknow	54·4
Ferozepore . . .	72·6	Cawnpore	53·5
Hyderabad (Sind)	67·2	Quetta	52·1
		Lahore	51·6

Although the group as a whole appears to be on the increase in the All India figure and cannot be viewed with equanimity, yet it must not be forgotten that we have here in India a large body of men made fighting fit, young, healthy vigorous and susceptible who, up to the present year, have been serving abroad for 6 years and more at a stretch, away from their accustomed social contacts and amenities. It is little wonder that, temptations being what they are, many men succumb. Even now this is less than 5 men in every hundred over the course of the whole year, a figure which is remarkable for its smallness. From this it is not meant to infer that preventive measures should not be encouraged, but that the risks are great and probabilities of infection high.

Preventive measures are provided in Preventive Ablution Rooms in all units, but inspection has shown that a vast improvement could be made in many of these Preventive rooms and that the use of the rooms could be enormously increased. For example in Northern Command it was shown from an examination of the case cards that in 47% of cases Ablution rooms were not used at all and in 24% they were only used 24 hours after exposure. Or in other words in 71% of infections had not really been used at all. This is a matter to which attention is being directed.

As regards treatment the use of the Sulphonamide group of drugs has been stabilised and extended. Much has been written in the journals on the efficacy of the treatment, but from the military patients point of view the Sulphonamide group has changed the whole outlook of the disease, both for the patient and the doctor. Hospitalization has been markedly reduced and in one large area, Lahore, there had been no cases of relapse in nine months.

Complete rest appears to be an essential part of the treatment and in army cases, where this is practicable, the results are stated to be infinitely better than cases in civil life which do not do so well. There is now also a tendency for the Dermatologist under whom the majority of cases are treated to allow the body to develop and build up its own resistance for a week before any drugs are administered. Results by this method are stated to be definitely superior, recovery is more rapid and relapses are fewer.

The total cases of venereal and its groups are shown in the following table.

TABLE No. 38

Venereal diseases for 6 years by groups—Ratios per 1,000.

		Gonorrhœa.	Syphilis.	Soft chancre	Total venereal diseases.
		R.	R.	R.	R.
1933	B. O. Rs. . . .	23·2	4·9	5·0	33·4
	I. Os. & I. O. Rs. . .	4·7	3·9	2·2	10·8
1934	B. O. Rs. . . .	25·2	4·5	4·1	34·1
	I. Os. & I. O. Rs. . .	4·2	3·5	1·9	9·6
1935	B. O. Rs. . . .	25·8	6·0	6·8	38·8
	I. Os. & I. O. Rs. . .	4·6	3·7	1·8	10·1
1936	B. O. Rs. . . .	25·7	4·1	4·6	34·4
	I Os. & I. O. Rs. . .	4·8	3·4	1·6	9·8
1937	B. O. Rs. . . .	28·4	5·8	5·7	40·5
	I. Os. & I. O. Rs. . .	3·4	3·0	1·7	8·1
1938	B. O. Rs. . . .	28·0	7·6	7·9	43·5
	I. Os. & I. O. Rs. . .	2·9	3·1	1·5	7·5

18. Small pox

The state of protection of all personnel remains at a satisfactorily high figure, though there is a distinct tendency for the more senior ranks, and their families, to lapse owing to forgetfullness. Cantonment populations are relatively so immune from smallpox that the military inhabitants tend to forget the constant risk which lies outside.

TABLE No. 39

Half yearly state of vaccination of British troops and families.

	Percentage protected.	
	On 30th April.	On 31st October.
British Officers	99·45	99·76
British Other Ranks	99·40	98·32
Women and Children	99·65	99·92

There were only 11 cases of smallpox in 1938 compared with 13 cases in 1937 and 8 cases in 1936. British other ranks produced 5 cases, one each in Peshawar, Bareilly, Meerut, Cawnpore, Mhow, but there were no deaths. British Officers and their wives and B. O. Rs' wives had no cases. Amongst children there were 6 admissions with no deaths, the cases being 2 in Peshawar the others at Meerut, Cawnpore, Ranikhet and Mhow.

19. Cerebrospinal fever

There were 2 cases, one of which died at Ranikhet, the recovery case was at Razmak.

There were 23 cases amongst Indian other ranks and followers. The majority of cases reported were in Northern Command and occurred in the first quarter of the year.

20. Poliomyelitis

There were 6 cases amongst British and none amongst Indian troops.

Three of these were at Poona in July, August and September ; the others were at Landikotal (April), Dinapore (August) and Jhansi (December).

21. Respiratory Diseases

These have shown a slight increase over the past 5 years for British troops though Indian troops have shown a similar decrease.

TABLE No. 40

Respiratory Diseases by types—Ratios per 1,000.

	Diseases of bronchi and broncheoles.		Diseases of larnyx and trachea.		Pneumonia lobar and lobular.	
	B. O. Rs.	I. Os. & I. O. Rs.	B. O. Rs.	I. Os. & I. O. Rs.	B. O. Rs.	I. Os. & I. O. Rs.
1934 . . .	14·8	15·0	1·0	1·0	3·9	6·0
1935 . . .	15·5	11·9	1·2	1·0	4·2	4·9
1936 . . .	16·8	11·9	0·8	0·9	3·5	5·4
1937 . . .	17·2	13·3	1·3	0·9	3·2	5·2
1938 . . .	18·2	12·7	1·3	0·7	3·3	5·0

Of the total of 1,062 cases for British troops, 108 were cases of Pneumonia with 10 deaths compared with 101 cases and 2 deaths for 1937 and 132 cases and 14 deaths in 1936. Lobular pneumonia and pleuresy with 35 cases with 3 deaths and 58 cases with no deatbs respectively remained much the same as in previous years and there were 4 cases of empyema. The monthly admissions for the pneumonic group are shown in Table No. 41. Bronchitis with 741 cases was 33 less than in 1937.

TABLE No. 41

Monthly incidence of Pneumonia Group for 1938.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Lobar Pneumonia—													
B. O. Rs. .	16	5	7	7	12	8	12	3	3	5	14	11	103
I. Os. & I. O. Rs.	71	39	39	23	30	21	29	14	19	25	51	83	444
Lobular Pneumonia—													
B. O. Rs. . .	4	2	6	2	1	...	3	1	2	2	1	4	28
I. Os. & I. O. Rs.	16	10	3	3	5	6	9	5	9	11	8	29	114

Influenza has not appeared in any epidemic form until the end of the year when a definite epidemic diagnosed mild influenza appeared in Lahore District and was continued on into the beginning of 1939. The majority of cases were however Indian troops and were not admitted to hospital. Hospital admissions for all India totalled 570 cases as compared with 776 of 1937 and 646 of 1936.

Tonsillitis and Pharyngitis, which should be included in this group, produced 1,453 and 444 admissions respectively. In Northern Command there is an increase in general respiratory diseases of 11·16 up to a rate of 55·87 per 1,000, the highest since 1933. The increase is almost entirely due to the high rates for Tonsillitis in Peshawar, Rawalpindi and Waziristan districts. Pneumonia has shown a slight decrease in the Northern area.

22. Tuberculosis

There were 50 admissions for Pulmonary tuberculosis and only 1 for other tuberculosis in the present year, compared with 61 and 7 in 1937 and 57 and 9 in 1936. The cases were very evenly distributed throughout India and no instance was noted of special prevalence in any one unit.

Owing to the time which this disease takes to manifest itself it is very difficult to assess the source of infection, a problem which frequently arises in pension cases, particularly in the case of Indian troops. There is a general impression that tuberculosis, and pulmonary at that, is on the increase in India. Military figures which may be regarded as reliable do not bear this out as shown in the following table ; or rather show that as far as cantonment populations are concerned there is no obvious increase.

TABLE NO. 42

Incidence of Tuberculosis amongst British and Indian troops over a 5 year period (actuals).

Year.	British troops.	Indian troops.
1934	64	253
1935	69	275
1936	66	233
1937	68	194
1938	51	212

23. Diphtheria

There has been an increase in the numbers of diphtheria cases from all commands so that the all India figure has risen from 40 last year to 53 this year for other ranks. There were no epidemics amongst adults, though Poona had 9 cases, but there were three definite epidemics amongst children at Sanawar, Solon and Barian in Northern Command. These are described in paragraph 28 under children.

The general incidence is best shown by the following table.

TABLE No. 43

Diphtheria by Commands in categories—British Service.

	Northern Command.	Western (I.) Dist.	Eastern Command.	Southern Command.	Total 1938	Total 1937
Officers . . .	3	..	..	..	3	5
Other Ranks . .	18	11	9	15	53	40
B. O. Rs. wives .	2	..	..	6	8	3
B. O. Rs. children .	15	2	9	38	54	51
Total 1938 . .	38	13	18	59	128	..
Total 1937 . .	23	13	18	45	..	99

Amongst Indian troops there were only 6 cases altogether, the contrast being nearly as great as in 1937 when there were only 2 cases.

The incidence of diphtheria over the past 5 years is shown below. The contrast between British and Indian is considerable.

TABLE No. 44.

Admissions for Diphtheria over 5 years (actuals).

	British Troops.	Indian Troops.
1934	68	10
1935	66	3
1936	66	6
1937	40	2
1938	53	6

24. Effects of Heat

There has been an increase of thirty per cent. in admissions for heat-stroke and cases of heat exhaustion have been nearly doubled this year. As a cause of death these two conditions rank high, the All India percentage being nearly 13 per cent. while that for heat-stroke alone is over 27 per cent. In Northern Command with 49 admissions the death rate was 14 per cent. of cases. The results over the past three years are shown below.

TABLE No. 45.

Effects of Heat.

	Heat stroke.		Heat exhaustion.		Total effects.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1936 . . .	13	3	39	1	52	4
1937 . . .	15	6	37	2	52	8
1938 . . .	22	6	65	6	88*	12

*In the present year there was also one case labelled "Sunstroke" from Jubbulpore in which a B. O. R., with 6 months service in India, is stated to have developed a severe headache with abdominal pain, a furred tongue and constipation after 6 hours out in the sun.

The majority of these cases were in the northern half of India, Northern Command having 49 and Eastern Command 13 cases. In the former Command there was a very definite increase from 1·43 up to 3·40 per 1,000. This was entirely due to increases in the Peshawar district which produced 23 cases against 11 of the previous year and in the Lahore District which had 22 against 14 cases of 1937.

Of the 22 cases in Lahore District 14 were at Amritsar from one Company of Infantry chiefly in July when there were maximum temperatures up to 112°F. The one fatal case here was a stout, constipated alcoholic.

In the Peshawar District the hot weather in Nowshera was exceptionally severe with high temperatures, at 107° to 111°F. together with a high relative humidity in July and August. All troops were placed upon Epsoms salts twice weekly with very beneficial effects, the cases of heat stroke and heat exhaustion being 4 each.

In Waziristan there were only 2 cases amongst British troops, a point well worthy of note considering the extremely hard physical work and exposure undertaken by all troops on frequent columns in the worst of the hot weather.

The importance of occupation, even if it be occupation out of doors in the sun all through the middle of the day, is well shown by this contrast between 2 cases in Waziristan and 14 cases from one Company in Amritsar.

Fortunately the shibboleth of " exposure to the sun means sunstroke " is rapidly dying out. It is now beginning to be recognised that the best way of keeping men healthy in the hot weather and preventing heat stroke is not to shut them up in barracks from 9 A.M. to 5 P.M., nor need a large, heavy topi be worn from dawn to dusk, but that men should be fully occupied, outside if need be, throughout the day provided reasonable common sense precautions are taken and immediate notice is taken of any one who appears to be off colour or looks ill. The Waziristan figures of this year, the results during the 1937 operations, the July civil disturbances in Lahore in 1936, the recent experience of training in the hot weather months in certain stations all indicate that heat stroke and heat exhaustion are *not* inevitable because men are engaged on hard physical duties out in the open throughout the day ; but rather the reverse, provided ample drinking water is available, that clothing and feeding are adjusted suitably, that common sense precautions are observed and that any men who appear to be off colour receive immediate attention.

There is now one other factor which appears to be of considerable importance and that is the maintenance of the total salt content of the body at a proper level. In paragraph 16 the issue of an extra salt ration for the reduction of minor septic conditions and boils was noted. But views are now being expressed that an extra salt ration may be of definite benefit in the maintenance of general health in the hot weather and the prevention or reduction of heat stroke and the effects of heat. A daily excess loss of salt in the perspiration which is not made good in the daily food must after 2-3 months produce a deleterious effect on the general tone of the body and particularly of the central nervous system. In a short article published in the Royal Army Medical Corps Journal on work done at Peshawar during the year, a medical officer noted that the salt loss was 6·8 grammes or almost ¼ oz. of salt for a normal route march of 9 miles in the hot weather of Peshawar. He found that the water requirements of a man marching 8 to 9 miles on a day when the temperature is 104·3°F. in the shade and relative humidity 47 per cent. was approximately *6 pints of water* in order to maintain real fighting efficiency, to which must be added the amount of common salt which has been lost during the day, which is estimated at practically half an ounce. Stokers at hard work in hot climates utilise weak solutions of salt water as their drink. In mines, with high temperature and humidity, the effect of salt drinks are dramatic in effecting recovery from incipient heat stroke or exhaustion. The use of increased salt for this purpose is therefore well worthy of consideration in the prevention of heat stroke and more particularly of heat exhaustion.

The seasonal incidence of these cases of heat stroke and heat exhaustion are shown below.

TABLE No. 46

Seasonal incidence of Heat Effects. (British Troops).

	Jan. A. D.	Feb. A. D.	Mar. A. D.	Apr. A. D.	May A. D.	June A. D.	July A. D.	Aug. A. D.	Sep. A. D.	Oct. A. D.	Nov. A. D.	Dec. A. D.
Heat stoke.	..	..	1	..	..	6	1	4	1	1	1	5	2	1	1	..	..	1	..	..	..
„ exhaustion	..	..	1	..	..	2	..	3	..	7	..	22	4	15	1	4	..	..	..	..	..

It will be observed that the preponderance of cases of heat exhaustion is towards the end of the hot weather period when the drain of salt from the body is likely to be having its greatest effect.

The admissions for the Effects of Heat over the past 5 years is shown below.

TABLE No. 47

Effects of Heat (Actuals).

	British Troops.	Indian Troops.
1934	90	23
1935	90	18
1936	52	19
1937	60	27.
1938	88	45

25. Mental Diseases

The admissions for mental diseases in recent years is shown most simply as a table.

TABLE No. 48

Admissions for Mental Diseases.

	British Troops.		Indian Troops.
	Admissions.	Invalided.	Admissions.
1934	152	67	120
1935	173	53	93
1936	145	73	104
1937	118	51	95
1938	109	65	93

Of the 109 admissions 26 were for Hysteria and 15 of these were invalided.

From Southern Command the report of the Mental Specialist includes the following interesting note which refers to cases about which a few records have been published from time to time in the Journal of the Royal Army Medical Corps.

"Cases have been seen where the exciting cause of the mental breakdown appeared to be impacted wisdom teeth. This point is also the subject of special investigation. In quite a number of cases the presence of impacted wisdom teeth would appear to be causal rather than coincidental and removal of the suspected tooth has secured a dramatic cessation of the symptoms."

26. The Dental condition of the Troops.

(a) *General.*—The general dental condition of the troops may be considered as very fair and every effort is made to provide routine inspection and the necessary treatment of as many men as possible. The treatment received by units and drafts before departure from the United Kingdom

continues to be generally excellent, only small unavoidable departures from this standard having been reported. The suspension of any dental standard on enlistment however means that a certain number of even poorer material than in the past, both in number and structure of the teeth, is beginning to arrive who will require even more attention and care than has hitherto been necessary. The proportion of artificial dentures requiring supply or upkeep must also increase.

(b) *Oral Hygiene.*—This continues to be uniformly excellent. It is one of the most gratifying and encouraging results of the efforts of the Dental Officers. The pride of the troops in their personal condition and in so frequently, voluntarily seeking treatment must be unequalled in any similar walk of life. Refusals of treatment, while officially permissible, are negligible.

(c) *Dental Treatment.*—The high standard of treatment, remarked in previous reports, is more than maintained and officers show much interest in acquiring the latest operative methods.

(d) *Observations on the results on Dental treatment on the general health of soldiers.*—The elimination of dental sepsis from practically the whole of the military personnel is a factor of the greatest importance in achieving maximum resistance to disease and in the high recovery rate of those who do fall sick. In debilitating diseases such as malaria, dysentery and enteric fever the physician can dismiss this complication and in acute surgical conditions, particularly abdominal, the surgeon can equally do so. Further in all cases of fracture of the jaw the field is immediately ready for operative treatment, there being no pre-existing dental sepsis.

(e) *Other information regarding Dental treatment.*—The Army Education Authorities of the General Staff have represented the desirability of the routine dental treatment of all children attending Army Children's Schools, as is the case at Home ; but, however desirable, this is impossible without a considerable increase in establishment.

27. Invaliding.

The rate has remained remarkably level over a number of years; varying from 7 to 11 per 1,000 over the past 10 years. It remains to be seen whether there is any effect noticeable from the alterations of certain physical standards which were made in 1936 and introduced in 1937. The rate for the present year is 9·35 compared with 10·97 of the previous year.

Pulmonary Tuberculosis with 62 cases and Mental diseases 51 cases again head the list of principal causes. In 1937 there were respectively 51 and 47 cases for these diseases.

Invaliding rates for B. O. Rs. during the past 10 years are shown below.

TABLE No. 49.

Invaliding. (*Ratios per 1000*).

	British other ranks.	Indian other ranks.
1929	9·78	10·20
1930	8·70	6·23
1931	9·76	8·73
1932	7·39	6·47
1933	9·15	5·68
1934	9·39	5·62
1935	6·90	5·54
1936	10·99	5·52
1937	10·97	5·49
1938	9·35	5·84

The principal diseases for which British other ranks were invalided are shown below.

TABLE No. 50.

Diseases for which men were invalided. (*Actuals*).

	1937.	1938.
Pulmonary tuberculosis	62	51
Mental diseases other than Schizophrenia	51	47
Fractures	34	12
Diseases of joints	27	26
Injuries other than fractures	27	32
Diseases of bronchi and bronchioles	26	12
Schizophrenia	22	18
Epilepsy	22	11
Deformities of limbs	18	4
D. A. H.	13	8
V. D. H.	12	6
Rheumatic fever	11	9
Otitis media	11	3
Diseases of Urinary organs	10	11
Other T. B.	6	8

28. Women and children—Childwelfare.

A. *The number of women* admitted to hospital has decreased in the past three years. The admission, death and invaliding rates are shown.

TABLE No. 51.

British Other Ranks' wives.

Casualties over 10 years. Ratios per 1,000.

Year.	Admissions.	Deaths.	Invaliding.
1929	321·1	2·30	14·79
1930	328·6	5·30	10·83
1931	334·4	5·75	17·02
1932	292·3	4·17	13·20
1933	313·2	2·75	11·45
1934	311·6	2·23	12·50
1935	312·4	3·35	9·33
1936	337·6	3·21	10·85
1937	319·7	3·62	10·13
1938	311·8	3·84	9·99

The principal causes of admission were the same as in last year, *viz.* :—

Abortion	100
Malaria	78
Dysentery	77
Tonsillitis	71
Diarrhoea	64
Cellulitis	38
Appendicitis	30
Bronchitis	30
Common cold	28
Pyelitis	25

It should be noted that the combined dysentery-diarrhoea group, 141 admissions, is really the commonest cause of admission.

In addition 834 women were admitted to hospital for confinement.

There were 15 deaths (3·84 per 1,000) among women, two less than the previous year.

In Northern Command the admission rate increased and the death rate was definitely higher. In all the other commands there was a decrease.

The number treated as out-patients was 3,179 or 814·5 per 1,000.

B. *Of children* the admissions, deaths and invaliding are shown below.

TABLE No. 52.

British Other Ranks' children: Ratios per 1000.

Year.	Admissions.	Deaths.	Invaliding.
1929	274·3	14·12	2·27
1930	284·4	12·29	0·92
1931	286·4	12·08	3·32
1932	299·1	12·72	2·09
1933	281·9	11·05	1·42
1934	299·6	11·83	2·31
1935	334·3	9·66	2·15
1936	335·4	13·40	3·23
1937	358·3	12·83	2·60
1938	353·4	9·75	2·74

The principal causes of admission were :—

Dysentery	225
Tonsillitis	192
Diarrhoea	163
Hypertrophy of Tonsils	148
Bronchitis	143
Malaria	70
Cellulitis	68
Constipation	66
Diphtheria	64
Common cold	58

The preponderence of the dysentery-diarrhoea enteritis group is again marked with 434 cases or 21 per cent of the total admissions. Diphtheria at 64 cases is an increase of 25 per cent.

There were 57 deaths amongst children. The principal causes of death were pneumonia 11 and enteritis 10. Twenty-six per cent. of deaths were due to the dysentery-diarrhoea and enteritis groups.

In Quetta there were 3 cases of infection with T. saginata in young children. In Ranikhet the intestinal group of infections is still regrettably high.

Diphtheria.—In addition to sporadic cases, definite outbreaks occurred at the Lawrence Royal Military School, Sanawar, at Solon and at Barian.

The Sanawar outbreak commenced in April when a boy, who was a patient in the infectious ward for measles, developed laryngeal diphtheria. Two boys who were probably responsible had already had a long history of having been chronic carriers in Poona, one for nearly nine months as a carrier of the virulent organism. He was then to have been invalided, but was reconsidered owing to numerous negative examinations. He appears to have been the focus of this epidemic.

The epidemic was stopped by immunisation of the whole School and all new arrivals with T. A. F. and the two boys appear to have been finally cleared of infectivity by tonsillectomy in September.

The Solon outbreak occurred in August. 6 carriers were found including an officer's servant. Mucidan gargles and voluntary immunisation with T. A. F. cleared the epidemic.

The Barian outbreak was in July to September. Eight cases and seven carriers were found. The cause was not discovered, but infection may have been spread by sucking milk through straws.

Child Welfare Centres.—For British families Centres exist at all large and medium sized stations. Relatively they are not so well patronised as at Home and tend to take the form of Mothers Unions. There is a tendency to bring

sick children to be seen by the Medical Officer, if he is there, instead of taking them to the hospital, with consequent loss of time in starting treatment of the children.

Funds are obtained from regimental subscriptions—special collections—grants from the Maternity and Child Welfare Bureau—and by sales of work and jumbles.

The work of the Centres consists of Home visiting and meetings are held fortnightly with lectures, advice and comparison of babies and help given by means of cheap baby foods, milk and materials for clothes.

An annual report and budget request Form A. G. 25 is submitted by all Centre Committees to Army Headquarters and to the Maternity and Child Welfare Bureau which is proving of value.

29. Schools.

Generally speaking these are noted as being satisfactory. They vary considerably and there are many minor defects, structural and in furnishings. Inspections are made and reports rendered annually on the Schools and the condition of the children; defects are being remedied steadily as money becomes available. There is no doubt that the hygienic standard of Army Children's Schools has greatly improved during the past 10 years. Minor improvements are being constantly made and completely new schools have been provided for Half moon Barracks, Ranikhet and at Chakrata. The sanitary accommodation has been much improved.

Overcrowding in schools in hill stations in the summer is often a defect with which it is difficult to cope owing to gross fluctuations in child-population in these stations.

Enlarged tonsils and dental caries are noted as the main physical defects of the children. No doubt most of the caries is in the temporary teeth, but even so the impression one gets is that the oral hygiene of the children of soldiers is definitely neglected.

Two epidemics are worth a note, they were however in civilian schools. At Lawrence College near Murree there was an outburst of Typhoid at the end of May with 20 severe cases and 2 deaths. All children are said to have had T. A. B. inoculation. The cause of the outbreak was suspected to be milk, but was not traced. At Murree in a large girls school an acute outbreak of dysentery was traced to extremely faulty sanitary and cookhouse arrangements and management.

In Southern Command attention has been drawn to the matter of eyesight and school work. The importance of keeping the head up and eyes at least one foot away from the work has been stressed. This point and the closely connected points of proper desk and seating accommodation and of lighting on the plane of work are being taken up for all schools.

In Quetta a temporary school has had to be used, but with an increase in families the school has proved to be much too small: outdoor classes have been used in the summer, but are obviously quite unsuitable for a Quetta winter and one teacher cannot teach in two separate huts.

Each child in the Western Ind. District schools gets a ½ pint of milk and a straw for 1 anna a day.

30. Rabies and Anti-rabic treatment.

Five cases of Rabies (Hydrophobia) occurred amongst troops, but none of officers or families. The distribution is shown below. There were also two " effects of anti-rabic treatment ".

TABLE No. 53.

District.	Station.	British. B. O. Rs.	British. Officers & families.	Indian. I. Os. & I. O. Rs.
Peshawar	Peshawar	1	..	..
Rawalpindi	Khanspur	1	..	..
Lahore	Lahore	..	..	1
Waziristan	Bannu	..	..	1
Bombay	Mhow	1	..	..
Deccan	Kamptee	1	..	..
Madras	Wellington	1	..	..

In Peshawar the case was associated with an epidemic amongst dogs in which a noticeable feature was the very short incubation period.

Anti-rabic treatment is carried out very extensively for all troops and their families. Treatment centres are provided at the military hospital in every large cantonment or where the size of the military population demands it, fifty-five being maintained during the year. In addition subsidiary centres may be established temporarily at any hospital for treatment of any special case or group of cases, so that military personnel need never travel far to receive early treatment.

Vaccine is obtained from the Central Pasteur Institute and treatment graded in accordance with the type of injury.

The history of each case is carefully assessed and in all cases of doubt or where treatment will allay fears, treatment is given.

The total of treatments by districts throughout the country is shown below.

TABLE No. 54.

District.	British.	Indian.	Total.
Peshawar	216	135	351
Rawalpindi	261	103	364
Lahore	121	64	185
Kohat	18	44	62
Waziristan	2	29	31
Western, I. Dist.	206	30	236
Bombay	95	17	112
Poona Bde. Area	70	6	76
Deccan	58	31	89
Madras	81	14	95
Lucknow	181	34	215
Meerut	280	55	335
Presy. & Assam	30	17	47
Total India	1,619	579	2,198

31. Sulphonamide group of drugs.

In view of the increasing notice and use of this group of drugs reports were called for on their use during the year. These indicate that use has been made of the group for a very wide range of conditions varying from parturition to chickenpox and including 56 separate types of disease. The value of the drug has been fully proved in cases of Gonorrhoea, all septic conditions, several resistant types of skin infection, and very markedly in cases of pneumonia and

the acute meningitic infections. The Enteric fever group, tubercular conditions such as empyema and peritonitis, and even malaria in certain stages are reported to show rapid improvement under this treatment. The demands have been great and with experience the exhibition of the drug is being put into its proper sphere of action.

32. Hygiene.

A. The Control of Food and other supplies.

Summary of work carried out at the Military Food Laboratory, Kasauli, during 1938.

(*a*) There has again been an increase in the work done during the year, a record total of 18,012 having been examined. The total includes work at the Ghi heating centre at Agra. This increase has been achieved without an increase of staff, but working hours had to be increased and work rearranged. The value of the work to the Army in India carried out by the highly trained, experienced staff cannot be exaggerated.

Table No. 55.

Summary of samples received, accepted or rejected.

Source of Sample.	Percentage of Rejections.	Number of samples received.	Number of samples accepted.	Number of samples rejected.
1. T/(*a*) For registration of contractors—				
From abroad	68·4	19	5	13
From India	41·7	201	116	84
2. T/(*b*)For tenders from approved firms—				
From abroad	15·4	13	11	2
From India	36·0	386	247	139
3. T/(c) For special report to the Director of Contracts—				
From abroad	60·0	40	15	24
From India	26·0	42	19	11
4. A. For check before final acceptance of bulk supplies—				
From abroad	1·2	82	80	1
From India	9·0	2,080	1,818	229
5. H. Samples of articles submitted by Medical officers not R. I. A. S. C. supply	..	106	2	3
6. D. Supplies received from sources outside India; I. S. D., London	4·1	97	93	4
7. W/P. Samples from Government controlled Mills	..	590	590	..
8. C/P. Samples for comparison with local prices	20·4	44	11	9
9. G/BS. Samples of grain from Bulk	..	684	684	..
10. G/SA Samples of Grain set aside by Agents	5·5	5,98	472	33
11. G/A Samples of grain for approval	3·6	4,92	473	18
12. G/CR Samples of crushed grain issued to supply depots	..	1,471	1,471	..
13. C. Samples of complaints from source	14·3	1,454	1,195	207
14. T/Y Samples from stocks half yearly	0·7	1,814	1,454	12

Note.—In certain cases no report was rendered. Some were "repeat" samples.

(*b*) The main causes of rejection under the three groups T/(*a*), etc. was the inability of manufacturers to realise the high quality required and to submit samples which appeared to represent surplus or unsaleable stocks. For example tinned milk old and with high acidity in inferior tins; pearl barley

coated with mineral matter in inferior tins; rice highly polished, par boiled and broken and biscuits which are very indifferent compared with English products.

Rum of good maturity is difficult to obtain owing to the ready sale available for raw spirits and lack of inducement to store stocks.

(*c*) *Group A.*—Is the check maintained on bulk supplies before final acceptance and indicates the real quality of the articles available for supply.

The samples from abroad are mainly from Australia which continues to produce excellent supplies with only 1·2 per cent. rejections. Australian jams are a far better quality than those from the United Kingdom.

The Indian products are not so satisfactory; indifferent stocks of biscuit, salt, pearl barley, rice, bran and even sugar are submitted in the hope that the mixed inferior grades will be accepted.

(*d*) *Under category H.* are miscellaneous samples sent in by medical officers, officers commanding hospitals, units, etc. and are articles not of R.I. A. S. C. supply. These include water samples from places as far apart as Port Blair and Fort Sandeman, samples of canvas and flannel, peroxide, bleaching powder, Ghi and the scale from a tank.

(*e*) *Group D. W. C. G. and T.* include samples which control actual bulk supplies obtained through the India Stores Department or those of Government controlled mills and of whole or crushed grains, dhalls, atta, etc. The general results are satisfactory and show, with some exceptions, that the quality of stocks has been good, and reflects favourably upon the control maintained over purchase by this laboratory.

(*f*) *Special work and research.*—This has covered a very wide field with results of great importance. Technique is constantly under revision and improvements in accordance with the latest ideas are introduced when proved to be of value.

(*i*) *Biological assays.*—The Vitamin "C" content of ascorbic acid tablets for protection against scurvy and the P_2O_5 (Phosphorus pentoxide) specification for rice were investigated.

(*ii*) *Dietetic survey* of the Lawrence Royal Military School, Sanawar was carried out and certain essential improvements brought into force.

(*iii*) *Food contamination* in connection with chemical warfare was examined and it was found that the well known tests are not satisfactory. Further work is in progress.

(*iv*) *Super-chlorination of water* for drinking supplies was tested. It was found that waters with high ammoniacal content were not sterilised in the 15 minute period and the margin of safety with a deteriorated bleaching powder is small. A special report is being prepared.

(*v*) *R. I. A. S. C. specifications and M. F. L. Pamphlet.*—The extremely important work of revision of the Specifications has been successfully carried through, and the pamphlet on "The method of submitting samples" has now been thoroughly revised and brought fully up to date. This pamphlet has now been incorporated in the revised R. I. A. S. C. Specifications.

(*g*) The *Ghi Testing Laboratory—Ghi Heating Centre, Agra.*—Improvements have been carried out in equipment and fittings and a large amount of work has been covered.

In general the Ghi has been satisfactory, but the acidity of the finished product has been high in certain cases. The limit of 11 points is not exceeded, but it is considered that a 9 point limit should be aimed at before the products leave the Centre. This will allow for a slight rise during storage to the specification of 11 points which should not be exceeded before issue of the Ghi.

The number of samples was 3,973. There were 3 rejections for high acidity and the average figure for acidity was high this season. 23 samples had to be re-heated, 30 samples retreated and 3 samples were completely rejected for dirt alone and 3,917 samples were finally accepted.

B. ACCOMMODATION.

A sum of Rs. 10,42,989 was provided during 1938 for improvements to existing and provision of new quarters for British personnel, and Rs. 3,10,110 was expended on improvements to existing or provision of new dining halls and cookhouses. Much remains to be done especially in the provision of dining rooms and cookhouses; but where money has been available very definite improvements have been made.

Work has actually been carried out at 8 stations in Northern, 2 in Eastern and 6 in Southern Command and at Karachi in Western Independent District.

Owing to criticisms of the types and structure of new accommodation to the effect that many of the newer types of quarters were much hotter than the old types of buildings, temperature experiments have been carried out during the year on both types of buildings. The results were very inconclusive and the trials are being repeated during 1939 in three distinct phases throughout the hot weather months. One fact which appears to have been established is that the orientation of the building has a definite effect on the temperatures within that building and the consequent comfort therein, rather than the actual structure of the building, within reasonable limits.

In Commands the following points have been noted :—

Eastern Command.—New married quarters have been constructed at Ranikhet and Calcutta, both much needed, and new married quarters and a School provided at Chakrata. Dining halls for troops have been made at Dulikhet (Ranikhet), Allahabad and Muttra.

Western Independent District.—The Quetta reconstruction Scheme goes on apace. The new barracks of British and Indian troops are very good. Those for Indian Troops, of a new Jack-arch pattern, are excellent and could with advantage be copied in many other stations. The quarters of officers and other ranks, British and Indian, are very satisfactory on the whole. All buildings here are being built of shock-proof construction, composed of reinforced concrete, separated, box-like sections with " crumple sections " between each solid section. The lay out of barracks and quarters has been carefully planned and the modern Quetta Cantonment is a vast improvement on many of our older Cantonments.

As a contrast at other stations, many old buildings are still in use and though cracked and draughty, appear to be healthy ; perhaps their very airiness is a blessing in disguise.

In Northern Command many of the old type of barracks are cold and dark, but are cool in summer. The standard of comfort is lower than that of British troops in the United Kingdom and Colonial stations. For Indian troops, barracks have been structurally much improved during the past 20 years and are now with minor exceptions reasonably satisfactory. offering relative standards of comfort better than those occupied by British troops. Barracks and quarters in many hill stations still leave much to be desired.

The greatest need is for (*i*) the construction of modern fly proofed messing blocks (*ii*) the construction of fly proofed latrines for all troops and followers and all personnel in barracks, quarters and bungalows.

Electrification schemes or work have been carried out at Rawalpindi, Lahore and Kohat and are in progress in several stations in Northern and Eastern Commands.

C. Hot weather precautions in the Plains.

From Northern Command, in which troops were on duty for days in the open during the hot weather, it is considered to be proved by the experience of the past few years that :—

> " it is much healthier to keep men employed even out of doors up to 11 and 12 o'clock, than to coop them up in barracks from 9 A.M. to 5 P. M."

It is considered to be even more important in hot weather that reveille' should be at a much later hour than is the custom at present.

Extra issues of salt.—This was issued as a prophylactic against boils and prickly heat. At Multan, Ferozepore and Peshawar all British troops and at Kohat one third of the troops were placed on ¼ oz. of extra salt per day from the 15th May to the 30th September. The case was " not proven " from mere records and figures. But on the other hand considerable subjective evidence indicated that the extra salt increases the physical fitness and feeling of well being of each individual and that their general health has benefitted. The possible effect of this extra salt on heat stroke and particularly on heat exhaustion have been discussed in paragraph 24.

D. Water Supplies.

The steady improvement of the past 20 years has been maintained and as a whole military water supplies are reaching a high standard of excellence. There are naturally exceptions and cases have been reported where trouble has arisen from old pipe systems which are beginning to give way. Such have occurred at Lahore and Secunderabad.

In Eastern Command it is recorded that there has been no disease directly traceable to the drinking water supply. At Fort William, Calcutta the improvements reported last year are now complete, the supply augmented and a new chloronome installed. At Agra a new scheme is in progress ; but, owing to the presence of fine sand and mica which precipitates rapidly, a sedimentation tank is being substituted for filters. At Lucknow, Ranikhet and Jhansi the supply has been augmented by tube wells and storage. At the latter a lime dosage apparatus has been added to deal with excessive acidity. At Fyzabad the supply is bad from shallow wells with primitive chlorination and distribution. Improvements are projected for 1941.

In Northern Command in general the supplies are good. At Abbottabad and Jhelum the condition is not satisfactory. The former relies on out of date filters which are too small and a crude drip-feed dosage with bleach solution, the accuracy of the dose depending on the whim of a chowkidar whose pay is Rs. 13 per month. The latter is supplied mainly from shallow wells directly connected with the water table of the river. The scheme, which would cost Rs. 80,000, is third on the major list of works.

At Kohat, Chloramination and at Fort Lockart, two rapid sand filters abolished the complaints of taste.

At Chaklala in water from artesian wells of great purity lactose factors were found in small samples, so the tanks were cleaned. Lactose factors continued. Investigation by the Deputy Assistant Director of Hygiene disclosed the fact that the coolies had omitted the cleaning of the walls of the tanks for lack of a ladder. Proper cleaning stopped the trouble.

At Lahore, which has deep wells of good quality, trouble arose in the distribution system, the 20 year old pipes showing grave defects in many parts.

At Razmak, where the open channel and exposed pipe supply was a constant source of trouble, 2 tube wells have been completed inside the " wire ", but the supply is limited. Traditionally tribesmen were never believed to tamper with water supplies ; but during this year they not only cut the supply, but poisoned the water with Picric acid. There were no untoward results.

In the Western Independent District at Fort Sandeman one Indian Hospital Corps man, employed as water chlorinator outside the fort, was murdered by a pathan. At Karachi, there have been two acute shortages, and now water is bought from the municipality. Manora now receives a piped supply, the old water barges having been discarded. At Quetta chlorination has been reduced to 0·25, the water is very good. Boring, to augment the supply in case of summer shortage, was commenced in the Hanna river but had to be stopped owing to the action of the local zemindars who exhibited " Oliver Twist " propensities.

Swimming baths for British Troops.—Work was in progress on the provision of swimming baths and filtration plants at the following stations :—

Rawalpindi.
Lahore.
Ambala.
Ahmednagar.
Lucknow.

Water filtration plants were installed in the existing swimming baths at Poona and Kirkee.

E. Anti-malarial measures.

All reports from Hygiene Officers comment on the enthusiasm and skill with which anti-malarial work was carried out in many cantonments. The reports from anti-malarial officers show the intense interest which many devote to this work.

During the year Rs. 1,58,000 were allotted for the work in cantonments : Rs. 66,757 for works M. E. S. and Rs. 91,243 for non-M. E. S. works, labour and other activities. In addition 14,480 gallons of Malariol were supplied and 11,500 gallons were used as a trial anti-larval measure in lieu of the crude oil and kerosene mixture which is normally issued on an as required scale and of which 25,800 gallons are required annually.

As a protective measure when nets or Bivi-nets, of which 2,000 were issued in Waziristan, cannot be used an anti-mosquito cream has been made available on an as required scale, and aluminium containers authorised on a 25 per cent. basis for all stations. This cream was extensively tried out in Waziristan in 1937 and 1938 and proved most successful.

In construction work the policy has been continued of alloting a large amount to one or two stations, *e.g.* Meerut and Jhansi, in order to carry through major projects considered to be essential for the *completion* of the cantonment general anti-malarial scheme with the idea that subsequently the work required will be limited to maintenance and routine measures. In a number of cantonments in which the large works have been completed, maintenance now requires very considerable expenditure, for example in the Poaka nullah, Peshawar, Rs. 3,000 had to be expended on repairs. In view of this in many stations the use of " Kuchha canalisation " is favoured in preference to expensive " pukka " works. In the latter repairs take much time and money, in the former the anti-malarial staffs can effect repairs rapidly and cheaply. For example at Poona the main nullah has been dealt with effectively by grassing as follows.

" The Bhairoba Nullah.—Almost the whole length of the nullah has now been turfed, eliminating scores of breeding places. The value of the grass on the banks of this nullah now increases with each succeeding year, and anti-malarial funds are already very considerably supplemented from the sale of grass. "

Spraying has been developed extensively in all Commands since its introduction some 5 years ago in Northern Command as a regular measure. It is proving most effective. It has the immense advantage that it deals not only with mosquitoes of all types, but also sandflies, the numerous winged and crawling pests of the hot weather and finally with the house fly. This method therefore affects malaria, sandfly fever, dengue, oriental sore and the intestinal infections. *Its value when carried out properly cannot be exaggerated.* Pyrethrum extracts made up in kerosene, 1 to 74 or even 100 as Pyefly mixture, are commonly used with great success, although the proprietary Pyrocide 20 is favoured by some. Deskito, an aqueous solution, is said to be very effective and is to be tried.

Biweekly spraying of barracks at a cost of Rs. 1-8-0 per a 30,000 cubic feet Barrack room is considered in Peshawar to have been responsible for the effective reduction in mosquitoes, sandflies and flies. There is no doubt that we should concentrate on spraying as a successful method, which can be carried out with ease whether troops are in barracks, quarters, camps or in the field. It is a measure which gives greatest results for the time and money expended. Spraying by means of special atomising machines, " Phantomyst " has been tried at Peshawar and Rawalpindi with reported success. The machines are *expensive* but the results are stated to be good. Arrangements have been made to provide 4 more machines for special stations. In smaller stations spraying with ordinary hand spray-guns is the method which is proving most effective.

Spraying of water surfaces with pyrethrum extracts has recently been found to be deadly to larvae and to be effective in one to two minutes. This offers yet another advantage of the method and may replace normal oiling.

Anticipatory or preventive treatment by means of Atebrin was tried in Northern Command at Khajuri plain and Wana and Plasmoquine and Quinine at Chakdara and Ali-Masjid in the Khyber. Set courses with proper controls were arranged and some success was achieved. The trials are to be repeated extensively in 1939 under full control to settle the question of the efficacy of the method as far as military personnel are concerned.

Mosquito catching by the oily plate method is successfully used in places, catches of 89,000 adult mosquitoes per month have been recorded.

The magnitude of the work in some stations may be gauged by the conditions at Nowshera where there was larval breeding easily visible along the banks of the Kabul river for 3½ miles. In Gorakhpur anti-malarial measures are hampered by water hyacinth.

In Western Independent District at Quetta normal methods were reorganised. Cooly gangs are expensive out of all proportion to their value, so the whole area was divided amongst *Unit Squads* which each dealt with every part of its area once weekly under its unit anti-malarial officer, not a medical officer. Frequent and controlled spraying was extensively used and proved most valuable, particularly as unit squads can deal with all unit buildings and quarters, where as cooly squads cannot without special arrangement.

The scheme was an immense success ; cooly squads were discarded and their cost saved. Unit squads after the necessary instruction worked with enthusiasm and the men and units attributed the very marked drop in malarial infection to this method. British units were not so good as Indian units,

because they did not realize that one *good* man on this work will keep 10 or more good men out of hospital. The advantage of the method is that units are trained to appreciate the work themselves, it can be continued in camp or any new station, and the money saved on coolies provides ample means for purchase of materials. It should be mentioned that success depended on a keen station commander and a malarial officer who is an enthusiast.

At Fort Sandeman from May to November 16,303 anopheles were caught of which 9,036 were A. stephensi : they were considered to come from the Zhob river. Aerial photography was used for malarial surveys.

Civil co-operation.—In a few places there are signs that civil authorities are commencing to co-operate with cantonment military anti-malarial work with consequent enlargement of the scope of the work. Railway authorities, Brewery companies, certain enlightened District Boards and a few Municipal authorities are amongst those who best co-operate. There is often however an attitude of " Hands off our area ", due possibly to the fear that there will be demands for money contributions.

F. Sanitation in Cantonments, Barracks and Camps.

In general the sanitation in and around barracks is good except for primitive methods of conservancy which exist in some stations. In cantonment bazaars a measure of control is maintained. In bungalow areas conservancy is frequently primitive and sanitation indifferent ; but outside cantonments there is usually, frankly no attempt at any sanitary control. In towns or villages close to military areas the conditions of filth, fly breeding and faecal deposition are ample to account for any prevalence of intestinal and other infections. This point was fully stressed last year, but appears again and again in all our Hygiene reports. In Northern Command a long term programme of proposals has been drawn up for each cantonment.

The sewage disposal plant at Thall has long been over loaded and with new construction the project is in hand of putting the whole place on water borne sewage with settling tanks and biological filtration. At Wana funds are insufficient to allow the whole place to be put on water borne sewage, so a septic tank system for latrine areas is being planned outside the perimeter.

In Eastern Command at Ranikhet a " sanitary improvement scheme " with continuity in policy has been adopted to try to reduce the Dysentery-diarrhoea incidence. An " aqua privy " has been adopted as an experiment. At Calcutta the water borne sewage system has made good progress. At Fyzabad special antifly measures were adopted which resulted in improvement of the fly nuisance for which Fyzabad is notorious.

In Southern Command at Jhansi the proximity of the Municipal trenching grounds to troops lines constitutes a potential danger and probably accounts for the high incidence of dysentery amongst troops in this station. The purchase of a new site is under consideration. At Poona the installation of water borne sewage connected with the Municipal system appears to be no nearer, the dispute is said now to have lasted 15 years.

In Western Independent District the Quetta sewage works have now been in action 8 months with an average flow of 184,000 gallons. Difficulties have been experienced with filters made of broken brick, because the settling tanks were too large, and with the sludge disposal. These difficulties are being overcome and the effluent is of high quality.

Septic Tanks.—It has been found that all properly installed septic tank systems have worked satisfactorily during the year. In spite of the issue of a M. E. S. drainage manual, care is still necessary, however, to ensure that contractors do their work properly in the matter of laying house and effluent drains.

In Northern Command all underground drains are now inspected by the Deputy Assistant Director of Hygiene, or his representative, before being filled in and it is not very uncommon for a drain to be failed in this examination at the first inspection.

Bore-hole latrines.—These have been put down in several stations during the past 3 years. They have failed where the bore does not reach subsoil water, for example in the I. H. C. lines and in the Arsenal at Rawalpindi. In others they have been thoroughly successful; but they are by no means popular for Indian use, they do require a reasonable amount of attention and they have been put to some extremely quaint uses in some instances. They should be of great value, but doubts have been raised about the extent of subsoil water contamination. This matter is under investigation by the Public Health authorities of the Punjab and pressing for the development of this method is suspended, pending the outcome of investigations.

Effects of Mechanization.—Two unexpected results of modern mechanisation are worth recording.

(*i*) At Sialkot, where the country is exceedingly flat and where considerable mechanisation has been introduced in certain units, as much as 5,000 gallons of water are used daily for the washing of cars. This drains to the Shed nullah in which special grading had been laboriously built to deal with definite amounts of storm water, expeditiously and thoroughly. The grading is now found to be unsuitable for this daily permanent flow and the nullah is constantly full and a source of embarrassment to anti-malarial work.

(*ii*) Also at Sialkot the change over from horses to machines has resulted in a complete dearth of stable litter for incineration of cantonment filth and refuse. Purchase of sufficient fuel would have meant an expenditure of Rs. 10,000 for this cantonment alone. A system of septic tanks with dumping depots is being tried out to deal with the disposal of filth.

Latrines for active service.—In consequence of remarks of the Assistant Director of Hygiene and Pathology, Northern Command in his Report on the Health of the Troops in the Waziristan operations of 1937 experiments were carried out during 1938 by medical and ordnance authorities to devise suitable lines for British and Indian troops for active service. These were to be:—

(*i*) Suitable for peace or war.

(*ii*) Lighter than the present patterns.

(*iii*) Capable of nesting and of being carried on pack transport.

(*iv*) For Indian Troops 2 pans interchangeable (*i.e.*, all pans the same).

(*v*) For British troops fly proof.

Receptacles on these lines have been evolved and, from preliminary appear to be satisfactory and have been sent for trials.

Fly proof gauze.—Experiments which were carried out by the Deputy Assistant Director of Hygiene, Lahore District to prove or refute the statement that H. domestica could readily penetrate the wire gauze ordinarily used by the M. E. S. (No. 20 S. W. G.-8 mesh) proved conclusively that these flies

can pass through gauze of an even finer mesh than this. As a result of these experiments "No. 22 S. W. G.9- mesh" will in future be used in all M. E. S. buildings in Northern Command.

Anti-rat measures.—Definite anti-rat campaigns have been carried out in cantonments for the prevention of plague at Poona where the work was commenced in 1933 and where a staff of 12 is employed, 10,473 rats were accounted for of which 275 were examined in the laboratory for plague with negative results. "Calcid, Baby dusters" using cyanide briquettes have been employed effectively. These have also been used in other stations. At Wellington, the campaign started in 1937, has been continued.

G. Joint Sanitary Boards.

These are slowly making headway in Northern Command. The first was formed in Murree in 1933. During the present year 13 more have been formed and have been found to do good. In certain areas the civil authorities have not agreed to this form of co-operation. At Jhelum a joint Military-Civil-Railway anti-malarial board has been functioning with effect.

The most important results achieved is the very fact that there is evidence of co-operation, that the officers of different authorities meet one another to discuss problems and the liaison in epidemics.

H. Dairies, Military and Civil.

Civil dairies where allowed in cantonments are nearly all local contractors dairies run in unsuitable premises, with untrained staffs, a minimum of adequate apparatus and milking arrangements varying from indifferent to bad. The trade they acquire in cantonments is due to price cutting and the giving of credit. The only saving grace is the fact that the milk is usually boiled.

Government Military dairies and the products supplied by these have been noted from Command and District reports as being satisfactory throughout the year. The benefit from a pure milk supply needs no emphasis and cannot readily be computed merely in terms of sickness.

Criticisms have been made from Southern Command that in that area the milk is pasteurised at only a few dairies and that dairies have not been provided at all stations where there are British troops.

Regimental dairies are run in some stations by unit arrangement and their products are relatively satisfactory.

I. Ice and Mineral Water Factories.

Regimental mineral water factories are noted as being on the whole very satisfactory. A piped water supply is a great safeguard. The introduction of crown-cork instead of the insanitary cod-bottles is a slow matter on account of the expense of changing stock and apparatus.

Ice factories in large stations are reasonably satisfactory, but small plants are often far less so. The provision of a safe piped water supply is the real safe guard in all these. The chief criticism of ice factories is the fact that, from the nature of the freezing tanks, the employees have to walk about over the top of the tanks. Where small freezing tanks are installed, such as the M. E. S. plant at Bannu, this defect does not exist.

From Western Independent District the comment is made that the ice ration is used for cooling mineral waters which the soldier then buys. "It is extraordinary that, if the soldier wants a really cold drink, he has to buy it". At Karachi a neat cooler for drinking water has been made, consisting of an ice box through which a pipe, laid in coils as is a coil of rope, supplies the drinking water. As long as any ice remains cold water is available.

J. Field Hygiene and Sanitation : Training and Inspection.

Reports indicate progress in the standard of knowledge of camp sanitation and elementary Hygiene amongst officers and men, but there is still much room for improvement. The first essential is that the officers of a unit shall understand the principles of sanitation and firmly believe in its importance, both in peace and war. Only by this means can the sanitary chaos of troop concentrations and movements be avoided. In Northern Command special courses of lectures by the Deputy Assistant Director of Hygiene, or a specially selected officer, was arranged for all officers additional to the training laid down in Regulations for the Army in India, Instruction 341.

A combined pamphlet on sanitation, water duties and first aid has now been published and issued to all.

Hygiene inspections.—All Assistant and Deputy Assistant Directors of Hygiene have made frequent tours round their areas during the year. Apart from the normal notes and reports, these tours of inspection are of great value in the personal contacts which these officers make and the personal knowledge of local conditions which they acquire.

33. Pathology.

The routine work again showed an annual increase during 1938. A total of 2,21,784 specimens were sent for laboratory examination during the year, 20,079 more than last year. A larger number of examinations was also carried out in clinical side rooms of hospitals in connection with malaria, dysentery cases and chemical examinations. In last year's report it was pointed out that a considerable number of examinations at present carried out in laboratories could be done equally well in clinical side rooms if their equipment was slightly increased. Every endeavour was made to obtain sanction for this extra equipment but owing to financial stringency this proposition was temporarily dropped. It is hoped to take up this matter again in the near future.

Enteric Group of fevers and Salmonella infections.—Repeated widal tests were carried out on " bacteriologically undiagnosed " so called enteric group cases. A total of 69 cases were diagnosed " group " infection throughout the year which represented 30 British and 39 Indian. Of these, 21 were serologically negative and were diagnosed on clinical grounds only. The great majority of the cases were mild with little or nothing beyond pyrexia, slow pulse, headache, constipation and bronchitic signs. The average pyrexial period for the above cases was 16 days.

It is felt that in the absence of definite serological findings, the diagnosis of " enteric group " is too readily made, frequently on the slenderest of clinical grounds. To quote from the annual report of the Assistant Director of Hygiene and Pathology, Northern Command : " It should be very rare that in a case of enteric fever bacteriological evidence (*i.e.*, from blood, faeces, or urine) cannot be elicited. The only logical procedure when bacteriological evidence is negative, Serological evidence doubtful and clinical signs indefinite is to designate the case P. U. O. Provided the case has been thoroughly investigated, no stigma attaches to such a diagnosis. On the contrary it is a scientific conclusion."

The employment of " H " suspensions for agglutination tests was discontinued in July 1938 and from that date TO and AO suspensions supplied by the Enteric Laboratory Kasauli were used by all laboratories, Felix's technique of agglutination being employed. Owing to frequent inoculation it is universally

agreed that results obtained from the use of H suspensions were inconclusive and of little value as a help to diagnosis. A rising titre of agglutination to TO and AO remained the diagnostic standard.

Several publications have recently appeared on the production of Vi antibodies in the blood during an attack of typhoid fever and also during the carrier stage. The authors of these articles suggest that in practically every case of infection or the carrier stage of typhoid fever demonstrable amounts of Vi antibody are developed.

In view of the above it was decided that investigations should be carried out by selected laboratories with the possibility of the employment of suspensions of Vi strains of typhoid bacilli for agglutination tests as a means of diagnosis. On the whole results obtained were disappointing but this to a large extent is considered to be due to inexperience of officers concerned in the correct reading of results obtained. Reports were rendered to the Officer in charge, Enteric Laboratory, Kasauli who correlated results obtained. The following extracts are taken from his consolidated report.

(*a*) A large number of individuals suffering from diseases other than typhoid fever may develop traces of Vi agglutinins in their blood; occasionally this may be considerable.

(*b*) Although the majority of patients suffering from typhoid fever develop appreciable amounts of Vi-antibody, several cases have been collected where it has not been possible to demonstrate it.

(c) Vi agglutinins were not demonstrated in every carrier. Fours cases were fully investigated, two convalescent temporary carrier. and two healthy permanent carriers (two urinary and two faecal) In two cases definite positive results were obtained. In another the Vi-titre was very low, between 10 and 20, which in view of the presence of traces of this antibody in so many non-enteric cases cannot be considered very significant. In the last example although Vi-antibody was present in low titres during the acute condition none could be demonstrated during the temporary carrier stage.

(*d*) There is evidence to show that Vi-agglutinins may appear very early in the blood during an infection. In some cases it appears before the O or H, and this fact may explain the very low or, complete absence of, titre obtained in some of the cases where the blood serum was first examined on the 8th day of illness or even later.

(*e*) It has been stated that there appeared to be little relation between the severity of the disease and the Vi content of the organism responsible. This is well illustrated in a small epidemic investigated. In 12 cultures examined from this epidemic (all the cases were very seriously ill and two were fatal) only one was rich in Vi-antigen and four, including one from a fatal case, were almost completely devoid of this antigen and did not appear to be capable to give rise to any Vi-antibody.

In next year's report it is hoped to record a fuller account of this aid to diagnosis. All workers in Military Laboratories in India are now supplied with Vi suspensions and they have also been issued with detailed instructions concerning the method of carrying out the test and reading results.

A standardised Vi anti-serum has also been issued to all laboratories. By the use of this serum comparisons can be made with results obtained, and the type of agglutination that should be obtained in positive cases appreciated.

Isolation of Enteric Group organisms from blood culture.—A total of 4020 blood cultures were taken during the year from cases suspected to be suffering from enteric group infection. The following is a summary of successful isolations. B. typhosum 72, B. paratyphosum A. 29, B. paratyphosum B. 2, and B. paratyphosum C. 1. The average day of isolation was as last year the 5th day after onset of the disease.

Of the total cultures 16 per cent. were found to be contaminated which is a great reduction compared with some years ago but slightly higher than last year.

In one Laboratory in which contaminations were high investigations were carried out concerning the possibility of the addition of a weak solution of gentian violet to the taurocholate broth. Preliminary tests were first made to ascertain the optimum dilution, which would entirely or almost entirely inhibit the Gram positive cocci, and at the same time not prevent free growth of the Gram negative bacilli. A dilution of 1—16,000 was eventually found to be the most suitable.

Media containing gentian violet in the above dilution was then issued to selected hospitals and the results obtained were most gratifying.

A review of the results showed that with ordinary taurocholate medium contaminations amounted to 19·4 per cent. whereas the substitution of gentian violent medium decreased the percentage to 5·5.

Duplicate bottles of media were employed in taking all blood cultures in one large British Military Hospital. In no case were organisms isolated from the plain broth while the other remained sterile, though in one case the organism was isolated from the gentian violet medium while the plain broth remained sterile.

The apparent advantage of this method of blood culture has been brought to the notice of all officers commanding laboratories in India and it will be interesting to see the figure representing percentage of contaminations in next year's report.

Isolation of Enteric Group organisms from faeces and urine.—The isolations of enteric group bacilli from faeces were 61 (B. typhosum 40, B. paratyphosum A. 18, B. paratyphosum B. 2, and B. paratyphosum C. 1). This figure is small in view of the fact that there was a total of 148 isolations from blood culture. Attention however is drawn to the opinion expressed in last year's report that apart from any question of defective technique in the collection of specimens in hospitals for despatch to Laboratories, it is probable that in a heavily inoculated individual isolations may be more difficult than in the case of the uninoculated.

All British troops diagnosed Enteric Group of infection during the year were automatically sent to the Enteric Fever Convalescent Depot Kasauli for examination concerning a carrier condition. In no case was any pathological organism isolated from any of these convalescents.

Organisms of the Enteric Group were isolated from the urine of patients on eighty-nine occasions. Some of the cases of Typhoid and Paratyphoid infection exhibited unusual features and are worthy of special mention.

(*i*) A case of typhoid fever in which pyrexia lasted for 15 days. B. typhosum was first isolated from the faeces on the 25th day of disease and the organism persisted until the 73rd day. The maximum presence of Vi agglutinins was demonstrated on the 32nd day which suggests that a relationship existed between the late excretion of bacilli and the late rise in Vi agglutinins.

(*ii*) A proved case of typhoid fever in which B. typhosum was isolated both in the primary attack and during a relapse from blood culture. During convalescence paratyphosum C. was isolated from the faeces. It was not possible to establish the fact that the original infection was a double one as it was only after the B. paratyphosum C. had been recovered from the stool that the blood serum was tested for the presence of these specific antibodies. It was then found to contain both the flagellar and somatic antibodies of B. typhosum and B. paratyphosum C., Vi agglutinins were also present.

(*iii*) A case of infection with B. paratyphosum A. primary pyrexia lasted for 17 days, a relapse however occurred on the 23rd day and the temperature then persisted for a further 30 days. During the relapse period the following complications occurred. Severe intestinal haemorrhage, severe haemorrhage from left nostril necessitating plugging, extensive ulceration of the palate and right pillar of the fauces, inflammation of left parotid gland accompanied by cellulitis of the whole of the left side of the neck, double otitis media with perforation of both tympani, cystitis. B. paratyphosum A. was isolated from a throat swab taken during the ulcerative period. The patient recovered.

(*iv*) A case of infection with B. paratyphosum B. The patient was admitted with all the symptoms of a very acute dysentery. No pathogenic organism was isolated from the stool. Pyrexia persisted for 7 days during which time a blood culture was taken which was negative. During a relapse a second blood culture was taken from which B. paratyphosum B. was isolated.

Organisms sent to the Enteric Laboratory, Kasauli for confirmation or identification.—Among the 246 cultures sent to the Enteric Laboratory during the year the following were classified :—

Bacterium typhosum		121
,,	paratyphosum A	43
,,	,, B	7
,,	,, C	3
,,	enteritidis	1
,,	,, var Dublin	1
,,	typhi-murium	2
,,	alkaligenes (now motile)	2

The total number of cultures forwarded for identification or confirmation has not materially changed from last year. The only organisms that were not completely identified fell into the coli or para-colon groups and no attempt was made to run these down to their species. The following remark was made by the officer in charge of the Enteric Laboratory. "The preliminary identification tests of the majority of the organisms received appeared to have been very satisfactorily carried out in Command, District and Brigade Laboratories."

It is interesting to note the occurrence of B. paratyphosum B. infection in numbers sufficiently high to be noticeable, though not in excess of last year as far as military cases are concerned.

The strain of B. enteritidis shown in the above table was isolated from the stool of a patient who was very dangerously ill. It was a very alarming case of sudden and profuse diarrhoea followed by extreme collapse and typically

choleraic cramps. The temperature rose to 105·6 but recovery was dramatically rapid. There were no associated cases although the patient lived in a mess where all partook of the same food.

Further investigations have been carried out by the Officer in charge, Enteric Laboratory into the alkalegenes group. Sera has been prepared from a number of non-motile gram negative bacilli that failed to ferment any of the ordinary carbohydrate media. These organisms had been cultivated from the blood of patients suffering from continuous fevers.

Serologically related strains were found on seven occasions. These were considered to be B. alkaligenes as distinct from viterio alkaligenes (B. faecalis alkaligenes of Petruscky.)

In one case the organism persisted for sometime in the faeces after it had disappeared from the blood. It appears that besides being more than one morphological type in this group of bacteria, there also exist several serological types of the non-motile variety.

Dysentery.—Specimens from 4,252 cases of dysentery and 3,735 cases of diarrhoea were bacteriologically examined during the year 1938. A total of 17,550 bacteriological examinations were carried out in connection with these cases, 1,620 more than in 1937. There were 213 cases of amoebic dysentery and 14 cases of mixed bacillary and amoebic infection. Typical bacillary exudates were present microscopically in 58 per cent. of the cases.

The percentage of isolation of organisms from cases with typical exudates varied in different laboratories from 91 per cent. to 50 per cent. The results on the whole were most satisfactory and were slightly better than last year. The following table shows percentages of isolations by Commands.

TABLE No. 56.

Comparative statement showing percentage of isolations of dysentery organisms by Commands—1938.

		Typical Bacillary Exudate.				Indefinite Exudate.				Percentage of total cases from which Bacillary organisms were isolated.			
1	2	3	4	5	6	7	8	9	10	11	12	13	
Commands.	Total Cases.	Cases.	Percentage of total cases.	Cases from which organism isolated.	Percentage of 5 with 3.	Cases.	Percentage of total cases.	Cases from which organism isolated.	Percentage of 9 with 7.	Typical Bacillary Exudate.	Indefinite Exudate.	Total.	Remarks.
Eastern Command	1,137	710	60·7	561	79·0	427	37·6	203	47·5	49·3	17·9	67·2	
Northern Command	1,618	933	57·7	742	79·5	675	41·7	256	37·9	45·9	15·8	61·7	
Southern Command	1,007	639	63·5	436	68·2	368	36·5	180	48·9	43·2	17·9	61·1	
Western (I) Dist.	496	214	43·6	155	72·5	276	56·3	102	36·9	31·6	20·8	52·4	

As in previous years isolations from out stations were poorer than those in which a laboratory is located. Lack of organization among the subordinate hospital staffs in details of collection of specimens again being considered to be the main cause. The enlarged clinical side rooms established at Jhelum and Wellington have thoroughly justified their existence. Sub-cultures of all organisms isolated are sent to the parent District Laboratory for confirmation which is also responsible for the supply of media, etc. In the case of Jhelum the percentage of positive isolations from bacillary exudate specimens was 88·9 and from indefinite exudate specimens 45·5. These figures are better than those obtained in several large laboratories.

At Wellington the causative organism was isolated from 67·6 per cent of cases of dysentery showing a typical bacillary exudate.

Types of dysentery organisms isolated.—Isolations of Andrews types of B. flexner increased by 265 over 1937, the Boyd strains on the other hand decreased by 22 but totalled 16 per cent. of positive isolations as compared with 17 per cent. last year. A total of 450 Boyd strains however were isolated. Type D 1 appears to be less common than other types and was almost entirely confined to the Northern Command.

Work has been carried out during the year at the Enteric Laboratory, Kasauli, on the preparation of mono-valent type specific sera for the accurate typing of dysentery organisms. It had been hoped to issue this serum to all Laboratories but it has been decided for the present to restrict the use of such sera to the Enteric Laboratory only.

During the year all unidentified organisms having the morphology and bio-chemical reactions of the flexner group of dysentery bacilli were forwarded to Kasauli for investigation even though they were cultivated from normal stools. The Officer in charge, Enteric Laboratory, Kasauli makes the following remarks concerning these organisms in his annual report. It must be appreciated, apart from the Flexner-Boyd common types and some of the rarer types, that there are many other bacilli with the same morphology and bio-chemical reactions that may have no true etiological relationship to bacillary dysentery. It is a well known fact that true dysentery bacilli may be cultivated from the stools of a patient over a very varying period and that in some cases they cease to be excreted after a few hours. Nevertheless, following an acute attack of dysentery a number of non-lactose fermenting bacteria are freqently found in the stools. The majority of these Gram-negative bacilli will be found to ferment glucose and mannite with the production of acid and gas, but on occasions others will be found that are of the anaerogenes type yet have no serological relationship to any of the Flexner-Boyd group and only in a very few cases with each other. It is considered that such organisms, in most cases, have no more importance than the para-colon group and are merely indicative of some changed reaction in the bowel.

The distribution of the various strains of dysentery bacilli throughout the four Commands during 1938 is shown by laboratories in Table No. 57 and the percentage of each group in each Command in Table No. 58.

TABLE No. 57.

Analysis of types of dysentery bacilli isolated during 1938.

1 Commands and laboratories.	2 Group A-1 B. flexner Andrews strains V. W. X. Y. Z. etc.	3 Group A-2 Boyd's strains 103, 170 and 119.	4 Group B Boyd's strains 88, 238, D 1, 274.	5 Group C. B.Sonne.	6 B. Shiga.	7 B. Schmitz.	8 Entamoeba histolytica.	9 Total.
Northern.								
Kasauli	11	1	8	10	3	1	..	34
Peshawar	79	21	18	12	14	8	5	157
Kohat	48	2	9	5	3	6	4	77
Razmak	232	24	19	18	20	25	13	351
Rawalpindi	32	35	15	18	15	6	7	128
Lahore	46	4	4	9	24	2	3	92
Bannu	28	1	3	..	6	2	4	44
Sialkot	8	5	2	9	7	1	4	36
Ambala	43	1	..	15	6	..	10	75
Abbottabad	25	1	2	2	3	2	7	42
Total	552	95	80	98	101	53	57	1,036
Southern.								
Poona	99	7	33	67	20	19	9	254
Colaba	23	3	2	7	3	3	3	44
Bangalore	50	3	14	16	6	11	44	144
Trimulgherry	21	14	47	40	10	17	13	162
Jubbulpore	36	7	6	8	12	2	5	76
Mhow	16	2	..	6	10	..	4	38
Nasirabad	5	1	..	1	4	3	6	20
Total	250	37	102	145	65	55	84	738

Western.								
Quetta	72	3	24	42	12	4	4	161
Karachi	47	..	..	23	1	6	5	82
Total	119	3	24	65	13	10	9	243
Eastern.								
Meerut	38	24	15	28	6	5	7	123
Lucknow	78	15	12	26	13	23	25	192
Calcutta	39	6	3	33	8	6	11	106
Bareilly	28	8	14	13	6	5	4	78
Dehra Dun	22	..	..	10	3	3	9	47
Jhansi	116	5	7	28	16	9	12	193
Allahabad	12	..	..	11	5	..	5	33
Total	333	58	51	149	57	51	73	772
Total All-India 1938	1,254	193	257	457	236	169	223	2,789
Total All-India 1937	989	234	238	460	246	163	242	2,572

TABLE NO. 58.

Percentage of types of dysentery bacilli isolated in the commands during 1938 and percentage of positive results to E. histolytica.

Command.	Total.	Group A-1 B. flexner Andrews strains V. W. X. Y. Z., etc.	Group A-2 Boyd's strains 103, 170, 119.	Group B Boyds strains 88, 288, P. 274-D-1 and D. 19	Group C B. Sonne.	B. Shiga.	B. Schmitz.	Positive E. histolytica.
Northern	1,036	53·3	9·2	7·7	9·5	9·5	5·1	5·5
Southern	738	33·9	5·0	13·7	19·6	8·8	7·4	11·4
Western (I.) Distt.	243	48·9	1·2	9·8	26·8	5·3	4·1	3·7
Eastern	772	43·1	7·5	6·6	19·3	7·4	6·6	9·5
Average All-India	..	44·9	6·9	9·2	19·6	8·5	6·0	7·9

In Table No. 58 it will be noted that there is little difference between Commands in the percentages of the various infections to the total in the Command. Western (I) District had again this year however higher percentage of B. Sonne infections.

These figures represent careful work in 26 laboratories all situated in different parts of India. They have now been very consistent over a period of years and although no figures are available from civil sources it is considered that they represent fairly accurately the various types of dysentery and their respective proportions among the civil population also.

Routine examination of menials prior to employment.—A total of 13,282 menials were examined during the year prior to employment. This represents a total of over 39,000 actual examinations. Organisms of the dysentery group were isolated on 51 occasions and of the Enteric Group on 3 occasions. Microscopical examination for the presence of Entamoeba histolytica cysts are not carried out as a routine measure but in many laboratories are voluntarily undertaken for instructional purposes. Twenty-nine thousand examinations of this nature were carried out and cysts demonstrated on 109 ocasions only.

All the above stools were also examined for helminth infection. The following table illustrates the findings in each Command.

TABLE No. 59

Command.	Tæniidæ.	H. Nana.	Ascaris lumbricoides.	Ankylostoma type.	Trichuris trichiura.	Enterobius vermicularis.	Strongyloides stercoralis.
Southern . . .	1	15	34	144	21	2	2
Eastern . . .	23	35	92	401	40	19	14
Northern . . .	22	28	60	677	15	4	...
Western Dist. (I) .	..	1	..	8	..	2	...
Total .	46	79	186	1,230	76	27	16

Diphtheria.—Throat swabs from 4,097 suspected cases of diphtheria were examined during the year of which 182 were positive to C. diphtheria. In all 5,429 bacteriological examinations were made 362 being found positive. The total number of contacts examined was 3,157 of which 63 were found to be carriers.

The positive cases occurred in Commands as follows. Southern Command (81), Northern Command (62), Eastern Command (23), Western Ind. District (16).

Nasal swabs from 213 suspicious cases were bacteriologically examined with positive findings on 9 occasions.

As the result of instructions issued last year all virulence tests were carried out by injection and post mortem examination of guinea pigs in addition to the intradermal test.

An outbreak of diphtheria occurred in a military school in Northern Command, which was traced to a carrier who a year previously had been carrying virulent organisms but who had been declared free as the result of a large number of negative swabs. The outbreak occurred in the summer months so it was deemed inadvisable to attempt to import Schick toxin for intradermal testing. Cases continue to occur in spite of extensive swabbing followed by isolation of all positive individuals so it was eventually decided to immunise the whole school population with T. A. F.

The results of this procedure, in the absence of Schick toxin, naturally could not be accurately assessed ; but no further cases of clinical diphtheria (that is, cases with a diphtheritic membrane) occurred after the attempted

immunisation had been completed. As was to be expected, however, swabs taken from cases of pharyngitis and tonsillitis continued to be positive for C. diphtheriæ for a considerable time after the outbreak of clinical diphtheria had ceased. The true state of affairs was distorted, as it so commonly is in children's schools, by the fact that large numbers of children were found with hypertrophied and septic tonsils in which the C. diphtheriæ lurked for a long time. The probability is that the large majority of these cases of sore throats with swabs positive for C. diphtheriæ were cases of non-specific tonsillitis which were merely incidentally carrying C. diphtheriæ, (*i.e.*, so-called bacteriological diphtheria), a state of affairs which is common in institutions after mass artificial immunisation has been performed.

It is interesting to note that out of 34 cases of this "bacteriological" diphtheria five individuals carried virulent C. diphtheriæ in their noses or throats for more than a month after all clinical signs of sore throat had disappeared, and it was only after thorough surgical toilet of the pharynx and posterior nares that they ceased to carry.

Three of these persistent carriers were of the nasal type, their throat swabs only rarely showing C. diphtheriæ. This illustrates the very great importance of examining nasal swabs in all carrier examinations carried out with a a view to controlling and tracing the source of an outbreak of diphtheria.

Cerebrospinal Fever.—Of the 30 cases investigated during 1938, positive cultures of meningococci were obtained from 18. The majority of the remaining 12 cases diagnosed by direct examination of cerebrospinal fluid occurred in stations where laboratories were not situated. Of the 18 positive cultures 11 were Group I, 5 Group II and two were not classified.

A total of 251 cultures from cerebrospinal fluid of cases of varying nature, including the above, were made during the year, the great majority of which were from Northern Command laboratories (129). Cell counts totalled 295, microscopical examination of deposits 243, Langes gold chloride test 63, chemical examinations, *e.g.*, globulin, chlorides, etc., 327. Two hundred and fifty-three Wassermann tests were carried out on cerebrospinal fluid in Poona, Rawalpindi, Quetta and Meerut.

Laboratory tests in connection with the diagnosis of syphilis.—The number of Wassermann tests carried out in the four laboratories engaged in this work numbered 17,177 and the number of Kahn tests 13,518. These figures in the case of the former are 530 more than last year and in the case of the latter show an increase of 6,647.

The percentage of haemolysed or septic sera, and broken capsules remain much the same as in previous years.

The employment of the Kahn test as a check or the Wassermann test as will be seen from the above figures is yearly becoming more popular. In the Command Laboratory, Poona and in the District Laboratory, Meerut it is carried out on almost all sera received. Last year difficulty was experienced in the District Laboratory, Quetta in carrying out this test owing to precipitation of cholestrin in the cold weather. This difficulty has however now been overcome by the use of an antigen prepared by the Difco Laboratories Detroit which is obtained from Messrs. Baird and Tatlock, London. This Laboratory continues the practice of bleeding guinea pigs not more than once a month. It has been found possible to keep concentrated complement frozen for six weeks and then still obtain a satisfactory titre of 1/50.

The work done in the four laboratories and results obtained are shown in Tables 60 and 61.

TABLE No. 60.

Wassermann tests and Kahn tests—1938.

Laboratory.	Total Wassermann tests carried out.		Total wassermann tests carried out on blood sera from all sources.	Total wassermann tests on C. S. F.	Total Kahn tests.	Percentage sera hæmolysed and septic.		Percentage capsules broken.	
	British troops.	Indian troops.				Br.	Ind.	Br.	Ind.
Southern Command Lab., Poona	1,807	1,167	4,242	48	4,239	2·26%	3·08%	0·28%	0·26%
District Lab., Rawalpindi	2,288	3,654	5,996	97	3,890	1·08%	1·80%	0·43%	0·40%
District Lab., Meerut	1,967	2,342	4,387	51	4,029	4·50%	5·10%	0·25%	0·34%
District Lab., Quetta	1,137	1,109	2,552	67	1,450	2·01%	2·20%	0·34%	0·18%
Total	7,199	8,272	17,177	263	13,518	..	..	..	..

TABLE No. 61

Results of Wassermann tests—1938

	Poona.		Rawalpindi.		Meerut.		Quetta.	
	Nagative.	Positive.	Negative.	Positive.	Negative.	Positive.	Negative.	Positive.
Syphilis primary (before treatment) . .	1,401	232	5	62	39	159	...	5
Syphilis secondary (before treatment) .	...	59	...	17	...	39	5	16
Syphilis tertiary (before treatment) . .	...	53	...	5	...	48	...	5
Syphilis (after treatment) .	971	309	1,841	398	1,514	217	630	211
Gonorrhœa .	40	4	113	18	9	...	24	12

The number of cases diagnosed primary syphilis on a positive Wassermann reaction is still considered to be too high. This applies particularly to Indian troops but it is realised that many of them report late for examination having previously endeavoured to treat themselves or received local treatment in the bazaar.

Instructions were issued in November 1937 that in the case of hospitals situated in a station where no laboratory existed sera taken from the suspected sore should be despatched in a sealed capillary pipette to the nearest laboratory for examination for the presence of T. Pallida. This procedure has been successful in a certain number of cases and enabled the patient to be diagnosed and treated before the Wassermann reaction became positive. The following tables show the method by which primary infectious in the case of British and Indian troops were diagnosed throughout the year by Commands.

TABLE No. 62

British Troops

Command.	Number of cases of syphilis fresh admitted to Hospital.	Number of cases of syphilis fresh diagnosed			
		By demonstration of T. Pallida.	On Positive Wassermann Reaction.	By demonstration of T. Pallida and on Positive Wassermann Reaction.	By other methods.
Northern Command .	50	22	26	2	..
Eastern Command .	109	54	50	4	1
Southern Command .	102	43	49	9	1
Western Ind. District .	38	22	16	..	..
Total All-India . .	299	141	141	15	2

TABLE NO. 63.

Indian Troops

Command.	Number of cases of syphilis fresh admitted to Hospitals.	Number of cases of syphilis fresh diagnosed			
		By demonstration of T. Pallida.	On Positive Wassermann Reaction.	By demonstration of T. Pallida and Positive on Wassermann Reaction.	By Other Methods.
Northern Command	100	27	68	5	..
Eastern Command	100	21	77	2	..
Southern Command	86	17	65	4	..
Western Ind. District	18	1	16	1	..
Total All-India	304	66	226	12	..

Anaemias.—During 1938 over 100 cases of anaemia were admitted to Indian hospitals in Waziristan District. Complete blood pictures were carried out by the Deputy Assistant Director of Pathology on 96 patients suffering from clinical anaemia. As the result of these investigations it was ascertained that 30 had normal blood pictures, 26 were suffering from hypochromic anaemia and 40 from hyperchromic anaemia. The microcytic anaemias were quickly cured by massive doses of iron, while the macrocytic responded satisfactorily to treatment by liver or marmite. The fact that these latter anaemias made full recoveries on marmite or liver points to the conclusion that they are belonged to the group of Tropical nutritional anaemias. Such anaemia may be produced in many ways; but it would appear that, in the case of the Indian soldier, it is the result of a diet which is poor in Vitamin B. This diet in normal times of peace is as a rule adequate for the sepoy but it seems probable that an insufficient reserve of vitamin B is built up in his body so that when extra demands are made on this reserve, as may occur as the result of diarrhœa, dysentery, malaria and other debilitating diseases, especially when accompanied by the strain of active service a state of hypo-vitaminosis B, is produced and is manifested as Tropical nutritional anaemia.

Since the above small outbreak occurred arrangements have been made whereby marmite is available for issue to all hospital patients in ample quantities.

Notes on Routine Laboratory Work.—Biochemical work showed a definite increase over 1937, *e.g.*, blood sugar estimations rose from 281 to 321 and blood urea from 229 to 278. Blood typing tests were carried out on 1294 individuals which is an increase of 570 tests as compared with last year. All laboratories now prepare and store their own Group II and III sera in order to be in a position to carry out this test. Blood sedimentation tests increased by 221 to 432, but these tests are still restricted to certain laboratories; of the above 231 were carried out in Razmak. This laboratory was also responsible for 261 reticulecyte counts which was more than 50 per cent. of the total number completed by all laboratories. Post mortem examinations were undertaken when considered necessary and numbered 80, of which 33 were performed in Northern Command and 16 in Western Ind. District.

Bacteriological examinations of water numbered 2,972 which is an increase of 735 over last year. It is the practice now in all laboratories to test samples of water taken from the actual source of supply in addition to samples from taps, etc., as drawn by the consumer. This practice is necessary in view of the age of certain distributing systems. It is now understood by all that no result on drinking water for troops is satisfactory unless there are no faecal B. Coli present in 100 cc. of the samples submitted. Chemical examinations of water are comparatively rarely asked for and numbered 159 as compared with 338 last year. Bacteriological examinations of milk were asked for on more occasions than last year and numbered 395.

There were 874 dark ground examinations for the presence of T. pallida in scrapings but as the total number of positives or negatives from cases eventually diagnosed as syphilis were not recorded by all laboratories, it has not been possible to assess these results. The diagnosis of primary syphilis by means of Wassermann reaction or by the demonstration of the presence of T. pallida has been referred to previously.

The high figure of 10,702 was reached in cultural examinations of urine which included nearly 1,500 examinations carried out in Kasauli in connection with the investigation of carrier of organisms of the Enteric Group. From the total number of specimens examined in all laboratories B. Coli was isolated on 446 occasions. Again this year the District Laboratory, Rawalpindi was responsible for the greatest number of isolations.

There were 349 examinations of scrapings from cases suspected of suffering from tropical sores. Leishman Donovan bodies being found in 80 instances, of which 57 were demonstrated in the District Laboratory, Quetta. This figure is much less than last year when 170 examinations were positive and is interesting in view of the fact that during 1938 there was an increase in the admission rate for sandfly fever.

The quantities of serum and agglutinable suspensions issued to laboratories by the Enteric Laboratry, Kasauli were as follows. Agglutinating sera 4,500 ccs. Standard agglutinable suspensions 65,000 ccs. Concentrated agglutinable suspensions 11,000 ccs.

Owing to the simplification of the serological diagnostic methods employed for the Enteric Group of Fevers with the adoption of the Felix method only for this work the quantities of the various agglutinable suspensions issued to laboratories is considerably less than last year. The preparation of the Vi-antigens involves much more work, than the preparation of 'H' or 'O' antigens and the time saved by the smaller requirements of Standard Agglutinable Suspensions has been more than taken up by these new productions.

Apart from the work of supplying these standard products to Military Laboratories the majority of the Medical Schools and larger Civil Institutions in the country apply to this laboratory for sera, suspensions and type cultures.

Tissues sectioned and reported on totalled 619 which included a large number of reports on tumours. In addition a total of 194 sections were made from the brains of horses, jackals, monkeys and dogs suspected of having suffered from rabies. Negri bodies were demonstrated on 76 occasions. New methods for staining sections of this nature were suggested by three officers in their annual reports, these are being tried out at present and will be referred to in next year's report.

The amount of section work done, apart from the size of the station obviously depended on the interest taken by the officer in charge of the laboratory and many of the above examinations were undoubtedly carried out for instructional purposes only.

The number of antegenous vaccines prepared decreased slightly from last year but numbered 507.

During the year 8 medical officers, 6 assistant surgeons and 14 sub-assistant surgeons were trained in laboratory duties and in addition 15 assistant surgeons and 31 sub-assistant surgeons were trained in clinical side room work. This latter training is considered to be of great importance especially as regards the diagnosis of malaria.

With very few exceptions nearly all laboratories are now equipped with up-to-date equipment and within reason any special equipment requested for special work has been and can be provided annually.

The Medical Directorate's Technical Library has been extensively used by many medical officers throughout India, a total of 109 reference books having been issued on loan throughout the year.

It is satisfactory to note that practically all officers commanding hospitals have made special reference in their annual medical transactions concerning the close liaison between the pathologist and medical officers in charge of cases. It is considered to be due in a great measure to this liaison that the results throughout the year have been so satisfactory.

34. X-ray Examinations

There were 27,658 X-ray examinations carried out, the details are shown in Appendix I.

35. Surgical operations

Surgical operations numbered 3,331. Details by groups of diseases are shown in Appendix II.

36. Anaesthetics

3,039 anaesthetics were given during the year, details are shown in Appendix III.

APPENDIX I

Summary of X-Ray Examinations for the year 1938

[Compiled from I. A. F. (Medical)–27.]

No. of patients examined.		British	14,496
		Indian	11,425
		Civilian	1,737
Number and nature of examinations carried out.	Bones and Joints.	Injury	16,782
		Disease	2,608
		Sinuses	859
		Teeth	1,002
		Lungs	3,587
		Heart	148
		Gastro Intestinal	528
		Liver and Gall bladder	336
		Urinary tract	983
		Genital tract	123
		Miscellaneous	490
		Foreign body	59
		Cysticercosis	65
		Pregnancy	66
Cases in which a contrast medium was used and nature of medium.		Barium	569
		Uroselectan B.	122
		Shadacol	139
		Lipiodol	19
		Per abrodil	15
		Sodium iodide	4
		Bismuth o Liq. paraffin	1
Miscellaneous information.		No. of ordinary films used	37,555
		No. of dental films	3,500
		No. of exposures	56,242
		No. of X-ray papers	1,862½
		No. of screen examinations	435

APPENDIX II

Surgical Operations 1938

King's Commissioned Officers (British Service)

Operations.	Total number.	Recovered.	Invalided.	Died.	Remarks.
I.—*Ear, Nose and Throat.*					
Tonsillectomy	2	2	..	..	
Nasal reconditioning	1	1	..	..	
Drainage of maxillary antrum	1	1	..	..	
	4	4	..	..	
II.—*Digestive.*					
Appendicectomy	21	21	..	..	
Fissure in Ano.	8	8	..	..	
Pelvi-Rectal Abscess (incision drainage)	1	1	..	..	
Perianal haematoma	3	3	..	..	
Ischiorectal abscess	4	4	..	..	
Hernia.	1	1	..	..	
	38	38	..	..	
III.—*Genito Urinary.*					
Hydrocele	2	2	..	..	
Cystoscopy	2	2	..	..	
Intermittant delatation	5	5	..	..	
Uretero-Lithatomy	1	1	..	..	
	10	10	..	..	
IV.—*Bones, joints, muscles, fasciae and bursae.*					
Osteomyelitis claviole	2	1	1	..	
Fractures, manipulation	22	22	..	..	
Antrostomy	1	1	..	..	
Maniscectomy	13	13	..	..	
Dupuytren's contracture (tendon)	2	2	..	..	
Bursitis elbow aspirated	1	1	..	..	
Aspiration knee joint	2	1	1	..	
Excision of semi-lunar cartilage	1	1	..	..	

Operations.	Total number.	Recovered.	Invalided.	Died.	Remarks.
ones, joints, muscles, fasciae and bursae—contd.					
retching	2	2	..	..	
of sheath	1	1	..	..	
ton—coccyx	3	3	..	..	
of Paris (reduction)	7	7	..	..	
uncture	1	1	..	..	
hip	1	1	..	..	
ns for dislocations	4	4	..	..	
	63	61	2	..	
—*Skin and subcutaneous tissues.*					
	28	28	..	..	
n and suture of wounds	6	6	..	..	
n (boil)	1	1	..	..	
sion of toe nails	3	3	..	..	
ision of warts	1	1	..	..	
scesses (incision)	3	3	..	..	
emoval of foreign body	6	6	..	..	
ursitis elbow	2	2	..	..	
odent ulcer	1	1	..	..	
xcision of Hypertrophied Xiphoid	1	1	..	..	
	52	52	..	..	
VI.—*G. S. Wound*	2	2	..	..	
	2	2	..	..	
VII. *Tumours and Cysts.*					
baceous, etc.	9	9	..	..	
ipoma	1	1	..	..	
	10	10	..	..	
VIII.—*Miscellaneous.*					
Intravenous saline and glucose closed method	4	..	..	1	3 still in hospital.
	4	..	..	1	3 still in hospital.

King's Commissioned Officers (Indian Army)

Operations.	Total number.	Recovered.	Invalided.	Died.	Remarks
I.—*Nerves.*					
Sciatica sub-dural injection	1	1	..	..	
	1	1	..	..	
II.—*Ear, nose and throat.*					
Mastoidectomy	1	1	..	..	
	1	1	..	..	
III.—*Blood Vessels.*					
Blood transfusion	1	1	..	..	
	1	1	..	..	
IV.—*Digestive.*					
Appendicectomy	5	4	..	1	
Rectum	2	2	..	..	
Palvic Abscess	1	1	..	..	
Fissure in Ano.	1	1	..	..	
Ischiorectal abscess	1	1	..	..	
	10	9	..	1	
V.—*Bones and joints.*					
Sequestrectomy	1	1	..	..	
Fractures Femurs	2	..	..	2	
Fractures manipulated and set	6	6	..	..	
Manipulation for dislocation	3	3	..	..	
Bursae and Tendons	1	1	..	..	
Maniscectomy	3	3	..	..	
	16	14	..	2	
VI.—*Skin and subcutaneous tissues.*					
I. A. T.	5	5	..	..	
Repairs of wounds	3	3	..	..	
Contusion plaster	1	1	..	..	
Ulcer right thigh excised	1	1	..	..	
Ingrowing toe nail	1	1	..	..	
Abscess	1	1	..	..	
Others	2	2	..	..	
Curettage of ulcer	1	1	..	..	
	15	15	..	..	
VII.—*Injuries.*					
G. S. wound	1	1	..	..	
Abrasions multiple	1	1	..	..	
	2	2	..	..	
VIII.—*Tumours and cysts.*					
Dermoid and sebaceous	2	2	..	..	
	2	2	..	..	

Surgical Operations 1938

British women and children

Operations.	Total number.	Recovered.	Invalided.	Died.	Remarks.
I.—*Diseases due to disorders of nutrition or of metabolism.*					
Acidosis	1	1	..	..	
	1	1	..	..	
II.—*Female Genitalia*					
Perineorraphy	1	1	..		
Dilation of cervix	6	6	..	..	
Retroversion of Uterus	3	3	..	..	
Uterine Polypus	1	1	..	..	
	11	11	..	..	
III.—*Urinary diseases.*					
Lithotomy	1	1	..	..	
Others	2	2	..	..	
	3	3	..	..	
IV.—*Bones and joints.*					
Fractures—reduction and plaster	30	29	..	1	
Excision of ganglion	1	1	..	..	
Fractures—manipulated	10	10	..	..	
Plaster of Paris—splints	4	4	..	..	
Sequestrectomy	1	1	..	..	
Osteomyelitis	3	3	..	..	
	49	48	..	1	
V.—*Skin and subcutaneous tissues.*					
I. A. T.	15	15	..	..	
Cicatrisation following burns	1	1	..	..	
Wounds, cleaned and stitched	5	5	..	..	
Avulsion of nails	2	2	..	..	
Ganglion of wrist	2	2	..	..	
Abscesses	12	12	..	..	
Cutaneous Leishmaniasis	1	1	..	..	
Cysticercosis	1	1	..	..	
Removal of foreign body	2	2	..	..	
Others	10	10	..	..	
	51	51	..	..	

Surgical Operations 1938

British women and children on the married quarters roll

Operations.	Total number.	Recovered.	Invalided.	Died.	Remarks.
I.—Diseases of Infections.					
T. B. glands excised	1	1	..	..	
	1	1	..	..	
II.—Ear, nose and throat.					
Tonsillectomy	64	64	..	..	
Deviation nasal septum	2	2	..	..	
Nasal Polypi	1	1	..	..	
Mastoidectomy	3	3	..	..	
Otitis media	1	1	..	..	
	71	71	..	..	
III.—Veins, Arteries and nerves.					
Blood vessels	5	5	..	..	
Blood transfusion	4	4	..	..	
	9	9	..	..	
IV.—Diseases of the Blood and blood forming organs.					
Blood transfusion. (1 case of Aplastic Anaemia)	8	7	..	1	
	8	7	..	1	
V.—Digestive.					
Appendicectomy	42	42	..	..	
Hernia	4	4	..	..	
Haemorrhoids Haemorrhoidectomy	1	1	..	..	
Pneumococcal Peritonitis	2	1	1	..	
Fissure in Ano	2	2	..	..	
Cholecystatomy	1	1	..	..	
	52	51	1	..	
VI.—Generative.					
Circumcision	14	14	..	..	
Ovaripexy	1	1	..	..	
Baldy-Webster	1	1	..	..	
Caesareen Section	6	6	..	..	
Incomplete abortion	2	2	..	..	
D. & C. cauterisation of cervix	4	4	..	..	
Septic mastitis (Inflammation of breast)	2	2	..	..	
Urethral carbuncle	1	1	..	..	
Hysteropexy	2	2	..	..	
Phimosis	10	10	..	..	
Hysterectomy	1	1	..	..	
Ulcerative inflammation of vulva	1	..	..	1	
Others	17	17	..	..	
Dilation and curettage	5	5	..	..	
	67	66	..	1	
VII.—Tumours and cysts.					
Meibomian	1	1	..	..	
Sarcoma	1	..	..	1	
Others	12	12	..	..	
	14	13	..	1	

Surgical Operations 1938

Warrant Officers, Non-Commissioned Officers and men of the British Army

Operations.	Total numbers.	Recovered.	Invalided.	Died.	Remarks.
I.—*Nerves.*					
Sciatica—Epidural injection	4	3	..	1	
„ manipulation	2	2	..	..	
Severed nerve ulna region	3	2	..	1	
N. Y. D. fits	1	1	..	..	
	10	8	..	2	
II.—*Eye.*					
Enucleation eye ball	2	1	1	..	
	2	1	1	..	
III.—*Ear, nose and throat.*					
Tonsillectomy	66	66	..	..	
Deviated nasal septum	7	7	..	..	
Mastoiditis	7	7	..	..	
Excision of glands	17	17	..	..	
Paracentesis drum	1	1	..	..	
Nasal polypus	2	2	..	..	
Furunculosis ear	7	7	..	..	
Sinusitis	2	2	..	..	
	109	109	..	..	
IV.—*Blood vessels.*					
Varicose veins	18	18	..	..	
Blood transfusion	11	7	1	3	
Common carotid ligation for intracranial art. Venous aneurysm.	1	..	1	..	
	30	25	2	3	
V.—*Glands.*					
Lymphadenitis incision	6	6	..	..	
	6	6	..	..	
VI.—*Respiratory.*					
Empyema	11	8	3	..	
Lobar pneumonia	2	2	..	..	
Aspiration chest	1	1	..	..	
	14	11	3	..	
VII.—*Digestive.*					
Appendicectomy	220	215	2	3	
Hernia	81	81	..	..	
Perianal abscess	1	1	..	..	
T. B. Peritonitis	1	..	..	1	
Cholecystectomy	1	1	..	..	
Laparotomy	5	2	..	3	
Intestinal obstruction	2	1	..	1	
Hæmorrhoidectomy	2	2	..	..	

Operations.	Total numbers.	Recovered.	Invalided	Died.	Remarks.
VII.—*Digestive*—contd.					
Appendix Abscess drainage	5	5	..	..	
Liver abscess	7	7	..	.	
Enterostomy	3	3	..		
Fissure in Ano.	8	8	..	..	
Fistula in Ano.	8	8	..	..	
Anal warts—excision	3	3	..	..	
Ischio-rectal Sinus	18	18	..	..	
Rectum and Anus	3	3	..	..	
Perforated Typhoid ulcer	2	1	..	1	
Hepatitis	2	1	1	..	
Rupture of Ileum	1	..	..	1	
	373	360	3	10	
VIII.—*Generative.*					
Varicocele	25	25	..	..	
Phimosis	27	27	..	..	
Hydrocele	9	9		..	
Circumcision	73	73	..	..	
Hæmatocele	1	1	..	..	
Orchitis	6	6	..	..	
Dorsal slit	3	3	..	..	
Cystoscopy	4	3	1	..	
Perinephric abscess	1	..	1	..	
	149	147	2	..	
VIII.—(*a*) *Generative male.*					
Hypospadias plastic	1	1	..	..	
	1	1	..	..	
IX.—*Bones and joints.*					
Insertion of extension wire	4	4	..	..	
Rupture Ant. cruciate	3	2	1	..	
Acute suppurative arthritis	14	6	8	..	
Aspiration	12	12	..	..	
Hallux Valgus	10	9	1	..	
Hammer toe	3	3	..	..	
Lumbar puncture	3	3	..	..	
Plaster of Paris, splints	54	54	..		
Meniscectomy	44	44	..	..	
Manipulation, knee, leg and elbow	60	59	1	.	
Bursae and Tendons	19	19	..	..	
Osteomyelitis	6	4	1	1	
Removal of intra articular cartilage	28	28	..	..	
Periostitis of ileums etc.	2	1	..	1	
Dislocations	36	35	1	..	
Congenital deformity	1	1	..	..	
Sequestrectomy	6	5	1	.	
Dislocation, manipulation	2	2	..	..	
Plating—radius	2	2	..	..	
Amputation	8	8	1	..	
Ganglion wrist, excision	2	2	..	..	
Resection of rib	1	..	1	..	

Operations.	Total numbers.	Recovered.	Invalided.	Died.	Remarks
IX.—*Bones and joints*—contd.					
Sequestrum finger removal	2	2	..	..	
Fracture phalanges	3	3	..	..	
Quadriceps Femoris reconstruction	1	1	..	..	
Arthroctomy	1	..	1	..	
Others	184	184	..	..	
	509	490	17	2	
X.—*Skin and Subcutaneous tissues.*					
I. A. T.	347	346	1	..	
Removal foreign body	22	21	1	..	
Avulsion of toe nails	104	104	..	..	
Revision and suture of wounds	89	88	1	..	
Carbuncle—excision	2	2	..	..	
Warts—excision	16	16	..	..	
Muscular Hernia of Fasia	1	1	..	..	
Amputation of breast	4	4	..	..	
Skin grafting	1	1	..	..	
Septic hands and feet	1	1	..	..	
Abscesses	47	46	1	..	
Whitlows	93	93	..	..	
Amputation finger	1	1	..	..	
Boils	9	9	..	..	
Lacerated wounds	1	1	..	..	
Burns, whole trunk	1	..	..	1	
Others	103	102	1	..	
Leucoplakia	1	1		..	
	843	837	5	1	
XI.—*Urinary diseases.*					
Epididymitis	1	1	..	..	
Orchiodectomy	1	1	..	..	
Nephrolithotomy	2	2	..	..	
Nephrostomy	2	1	..	1	
Dilatation of Ureter	1	1	..	..	
Hydronephrosis	1	..	..	1	
	8	6	..	2	
XII.—*Injuries.*					
Hæmatoma	6	6	..	..	
G. S. wound	12	10	1	1	
Head injuries multiple	1	..	..	1	
	19	16	1	2	
XIII.—*Tumours and cysts.*					
Papilloma	6	6	..	..	
Osteoma	2	2	..	..	
Epithelioma	1	..	1	..	
Lipoma	1	1	..	..	
Fibroma	2	2	..	..	
Sebaceous and others	143	142	1	..	
	155	153	2	..	

Surgical Operations 1938

British all others (R. N. and R. A. F. etc.)

Operations.	Total numbers.	Recovered.	Invalided.	Died.	Remarks
I.—*Eye.*					
Meibomian cyst—curettage	1	1	..	..	
	1	1	..	..	
II.—*Ear, nose and throat.*					
Tonsillectomy	20	19	..	1	
Sinusitis	2	2	..	..	
Maxillary sinusitis Lavage	1	1	..	..	
Mastoiditis	1	1	..	..	
Nasal reconditioning	1	1	..	..	
	25	24	..	1	
III.—*Blood vessels.*					
Internal Piles	5	5	..	..	
Blood transfusion	1	1	..	..	
	6	6	..	..	
IV.—*Digestive diseases.*					
Appendicectomy	38	38	..	..	
Hernia	15	15	..	..	
Cholecystectomy	1	1	..	..	
Laparotomy	4	2	1	1	
Thrombosed Piles	1	1	..	..	
Perianal abscess	1	1		..	
Fistula in Ano	1	1	..	..	
	61	59	1	1	
V.—*Generative.*					
Phimosis	8	8	..	..	
Varicocele	4	4	..	..	
Circumcision	16	16	..	..	
Dilation of cervix	1	1	..	..	
Hæmatocele	3	3	..	..	
Retroversion of uterus	2	2	..	..	
Chronic mastitis	1	1	..	..	
Incomplete abortion (D. and C.)	1	1	..	..	
	36	36	..	..	
VI.—*Urinary diseases.*					
Cystoscopic	4	4	..	..	
Vesicle calculus	1	1	..	..	
	5	5	..	..	

Operations.	Total numbers.	Recovered.	Invalided.	Died.	Remarks.
VII.—*Bones and joints.*					
Fractures	17	17	..	..	
Manipulation of Humerus	3	3	..	..	
Fibroma quadriceps tendon, excision	1	1	..	..	
Rupture musclesheaths	2	2	..	..	
Meniscectomy	17	17	..	..	
Excision Head of Radius	1	1	..	..	
Sequestrectomy	2	2	..	..	
Osteotomy	2	2	..	..	
Aspiration knee	4	4	..	..	
Fractures manipulations	8	8	..	..	
Manipulation joints	2	2	..	..	
Internal semi-lunar cartilage removed	3	3	..	..	
Bômb wound leg	1	1	..	..	
Dislocation reductions	3	3	..	..	
Talipes Varus Tenotomy	1	1	..	..	
Passive movements	10	10	..	..	
Radius and ulna	1	1	..	..	
Plating radius	2	2	..	..	
	80	80	..	..	
VIII.—*Skin and subcutaneous tissues.*					
Excision of sinus	2	2	..	..	
Incision of cellulitis hand and leg	2	2	..	..	
I. A. T.	18	18	..	..	
Wounds (toilet and suture)	8	8	..	..	
Avulsion of toe nails	4	4	..	..	
Removal of corn	1	1	..	..	
Plaster of Paris	6	6	..	..	
Boils	1	1	..	..	
Abscesses	28	28	..	..	
Removal of foreign body	3	3	..	..	
Skin grafting	1	1	..	..	
	74	74	..	..	
IX.—G. S. wound.	7	5	1	1	
	7	5	1	1	
X.—*Tumours and cysts.*					
Lipoma	1	1	..	..	
Papilloma	1	1	..	..	
Sebaceous and other cysts	22	22	..	..	
	24	24	..	..	
XI.—*Miscellaneous.*					
Paraplegia	1	..	..	1	
Malarial hyper-pyrexia	2	1	..	1	
	3	1	..	2	

Surgical Operations 1938

British Military Family Hospitals

Operations.	Total numbers.	Recovered.	Invalided.	Died.	Remarks.
Obstetric	36	36	..	..	
Gynæcological	10	9	..	1	
Abdomen	9	8	..	1	
Male generative organs	7	7	..	..	
Bones and joints	5	5	..	..	
Ear and nose	15	15	..	..	
Others	7	7	..	..	
Teeth and gums	8	8	..	..	
Digestive system	141	141	..	..	
Endocrine glands	1	1	..	..	
Tumours	1	1	..	..	
Salivary glands	1	1	..	..	
	211	209	..	2	

APPENDIX III

Anaesthetics 1938

Anæsthetics.	Total Number
Chloroform and Ether	748
Chloroform	23
Ether	158
Nitrous Oxide	761
Novocaine	189
Cocaine	22
Ethyl Chloride	203
Percaine	161
Spinal	189
Local	250
Evipan Sodium	220
Stovaine glucose	1
Gas and Oxygen	53
Ethocaine	47
Planocaine	9
Chloroform ether and Oxygen	4
Avertin and Ether	1
	3,039

SECTION II

On the Health of the Indian Army

SECTION II

ON THE HEALTH OF THE INDIAN ARMY

37. General

TABLE 1

General health statistics of the Indian Troops in India during the year 1938. Ratios per 1,000 of strength.

	Admissions.	Deaths.	Invalids sent to United Kingdom.	Invalids discharged in India.	Average constantly sick.
Officers . . .	386·8	10·40	19·86	...	13·67
Indian ranks . . .	421·8	2·21	...	5·83	15·78
Followers . .	272·0	3·62	...	3·66	10·11
Others*	...	...	...	...	...

The health statistics of Officers and Indian other ranks for the previous quinquennial periods from 1925 are shown in the following comparative table.

TABLE 2

Comparative table of sickness for Officers and other ranks

Period.	Ratio per 1,000.					
	Admissions.		Invalids.		Deaths.	
	King's Commissioned officers.	Indian ranks.	King's Commissioned officers.	Indian ranks.	King's Commissioned officers.	Indian ranks.
1925—29 . .	498·0	385·6	5·22	10·8	4·74	3·48
1930—34 . .	336·7	453·3	12·47	6·55	5·37	2·63
1935 . . .	346·8	422·7	6·82	5·54	7·31	2·15
1936 . . .	364·3	426·5	5·34	5·52	4·37	2·16
1937 . . .	359·0	391·7	9·23	5·49	4·35	1·77
1938 . . .	**386·8**	**421·8**	**19·86**	**5·83**	**10·40**	**2·21**

*Includes Reservists, Indian Territorial Forces, Royal Indian Marine, Indian States Forces R. A. F. Civilians and Pensioners.

38. Officers

The admission rates for officers which has shown a steady upward tendency for the past 10 years is this year again conspicuous for a rise while the rates for invaliding at 19·86 per 1,000 and for deaths at 10·40 per 1,000 continue to show an annual irregularity.

The principal causes of sickness were as follows :—

TABLE 3

Principal causes of sickness for Officers.

Diseases.	Ratio per 1,000.	Increase or decrease compared with 1937. Increase.	Decrease.
Digestive diseases other than tonsillitis, appendicitis and diarrhœa	41·6	..	5·7
Local injuries	48·2	6·4	..
Malaria	40·7	2·7	..
Minor septic diseases	21·3	..	11·8
Dysentery	29·3	3·2	.
Common cold	8·0	..	6·7
Appendicitis	11·3	..	2·8
Sandfly fever	19·4	5·3	..
Tonsillitis	15·1	1·5	..
Ear and nose	12·3	..	1·6
Influenza	7·6	..	2·7
Respiratory diseases	21·7	11·3	..
Diarrhœa	15·6	5·3	..
Diseases of bones, joints, muscles, fasciae and bursae	12·8	3·0	..
Urinary diseases	8·5	1·4	..

There were in all 22 deaths of which 10 were due to injuries, a cause which as usual produced the greatest numbe) of deaths, and 2 to Pneumonia. Of the remaining, deaths due to sickness the diseases were : Cerebro-spinal fever, Septicæmia, Poliomyelitis acute, Purpura hæmorrhagic, Uræmia, Coronary occlusion, Appendicitis, Gastric ulcer, Nephritis and Hydatid disease each 1 case.

39. Soldiers

There has been a continuance of the satisfactory fall of the past 10 years and admission rates in the present year at 421·8 per 1,000 are less than those for the past 8 years while the average for the past 4 years is 37·6 per 1,000 below that of the previous quinquennial period though not down to that shown before that period.

The principal causes of admissions to hospital were :—

TABLE 4

Principal causes of admission

Diseases.	Ratio per 1,000.	Increase or decrease as compared with 1937. Increase.	Decrease.
Malaria	109·7	11·8	..
Local injuries	59·8	8·0	..
Minor septic diseases	34·1	2·7	..
Pharyngitis	19·3	3·2	..
Bronchitis	12·4	..	0·2
Dysentery	17·2	4·8	..
Common cold	11·6	0·1	..
Venereal diseases	7·5	..	0·6
Scabies	11·2	3·5	..
Mumps	4·7	..	2·7
Sandfly fever	4·6	..	1·4
Tonsillitis	6·1	0·3	..
Influenza	4·4	..	1·3
Conjunctivitis	6·3	0·6	..
Diarrhœa	7·5	2·1	..
Pneumonia (lobar and lobular)	5·0	..	0·2
Dengue	1·1	..	4·0
Ankylostomiasis	4·3	0·1	..
Indigestion	5·2	1·1	..
Ringworm	4·8	1·3	..
Dermatitis	3·8	0·8	..
Constipation	2·6	..	0·3
Eczema	2·4	..	0·3
Otitis media	3·0	0·4	..
Synovitis	3·0	0·4	..
Myalgia	2·6	0·2	..
Coryza	1·4	..	1·0
Dracontiasis	1·8	..	0·3
Rhinitis	1·4	..	0·7
Pleurisy	2·3	0·5	..
Measles	1·7	..	0·1
Trachoma	1·8	0·1	..

TABLE No. 4—*conta.*

	Ratio per 1,000.	Increase or decrease as compared with 1937. Increase.	Decrease.
Piles	1·8	0·1	..
Pulmonary tuberculosis	1·7	0·1	..
Keratitis ulcerative	1·3	..	0·3
Colic	1·4	..	0·1
Jaundice catarrhal	1·7	0·2	..
Appendicitis	1·8	0·4	..
Anaemia secondary	2·2	0·8	..
Sciatica	1·2	..	..
Lumbago	1·1	0·1	..
Otitis externa	1·2	0·5	..
Gastritis	1·1	0·1	..
Renal colic	1·2	0·2	..
Chicken pox	0·9	0·1	..

The death rate shows an increase of 0·44 per 1,000, the rate now being 2·21 per 1,000 and the fall shown over the past 15 years has been steadily maintained.

The principal causes of death were :—

TABLE 5

Causes of death for Indian Troops

Diseases.	Ratio per 1,000.	Increase or decrease as compared with 1937. Increase.	Decrease.
Local injuries	0·54	0·13	..
Pneumonia (Lobar and lobular)	0·43	0·09	..
Pulmonary tuberculosis	0·12	..	..
Circulatory diseases	0·15	0·04	..
Meningococcal infection	0·07	..	0·03
Enteric group of fevers	0·07	..	0·02
Digestive diseases	0·19	0·10	..
General injuries	0·08	0·01	..
Tuberculosis (other than pulmonary)	0·04	..	0·02
Dysentery	0·03	..	0·01
Malaria	0·05	0·01	..
Urinary diseases	0·04	..	..
Nervous diseases	0·06	0·03	..

Invaliding.—The invaliding rate at 5·83 per 1,000 is 0·34 more than last year and 1·96 less than the rate over the past 14 years. The rate now is half of that of the quinquennial period 1925-29.

The main diseases for which invaliding was necessary or shown below.

TABLE 6

Principal causes of invaliding for Indian Troops

Diseases.	Ratio per 1,000.	Increase or decrease as compared with 1937	
		Increase.	Decrease.
Pulmonary tuberculosis	1·43	..	0·03
Injuries	1·51	0·73	..
Diseases of bones, joints, muscles, fasciae and bursae	0·34	..	0·10
Mental diseases	0·37	..	0·01
Respiratory diseases	0·18	..	0·15
Diseases of the eye	0·38	0·07	..
Diseases of the nervous system	0·37	0·10	..
Circulatory diseases	0·14	..	0·07
Digestive diseases	0·07		0·14
Other tubercular diseases	0·18	..	0·01
Diseases of urinary organs	0·10	..	0·01
Diseases of ear and nose	0·09	..	0·01
Venereal diseases	0·05	..	0·04
Diseases of blood	0·07	0·02	..

It will be noted that once again Tuberculosis heads the list, pulmonary tuberculosis accounting for 160 of the cases and the total Tubercular diseases form nearly 1/3 of the total cases invalided.

The average number of constantly sick in hospital was 1768·29 or 15·78 per 1,000 of the strength compared with 15·15 in 1937.

The average sick time to each soldier was 5·76 days and the average duration of each case was 13·65 days compared with 5·53 days and 14·12 days of 1937.

Men under barrack treatment (out patients) were 1229·9 per 1,000 compared with 1219·1 and 1343·3 of 1937 and 1936 respectively.

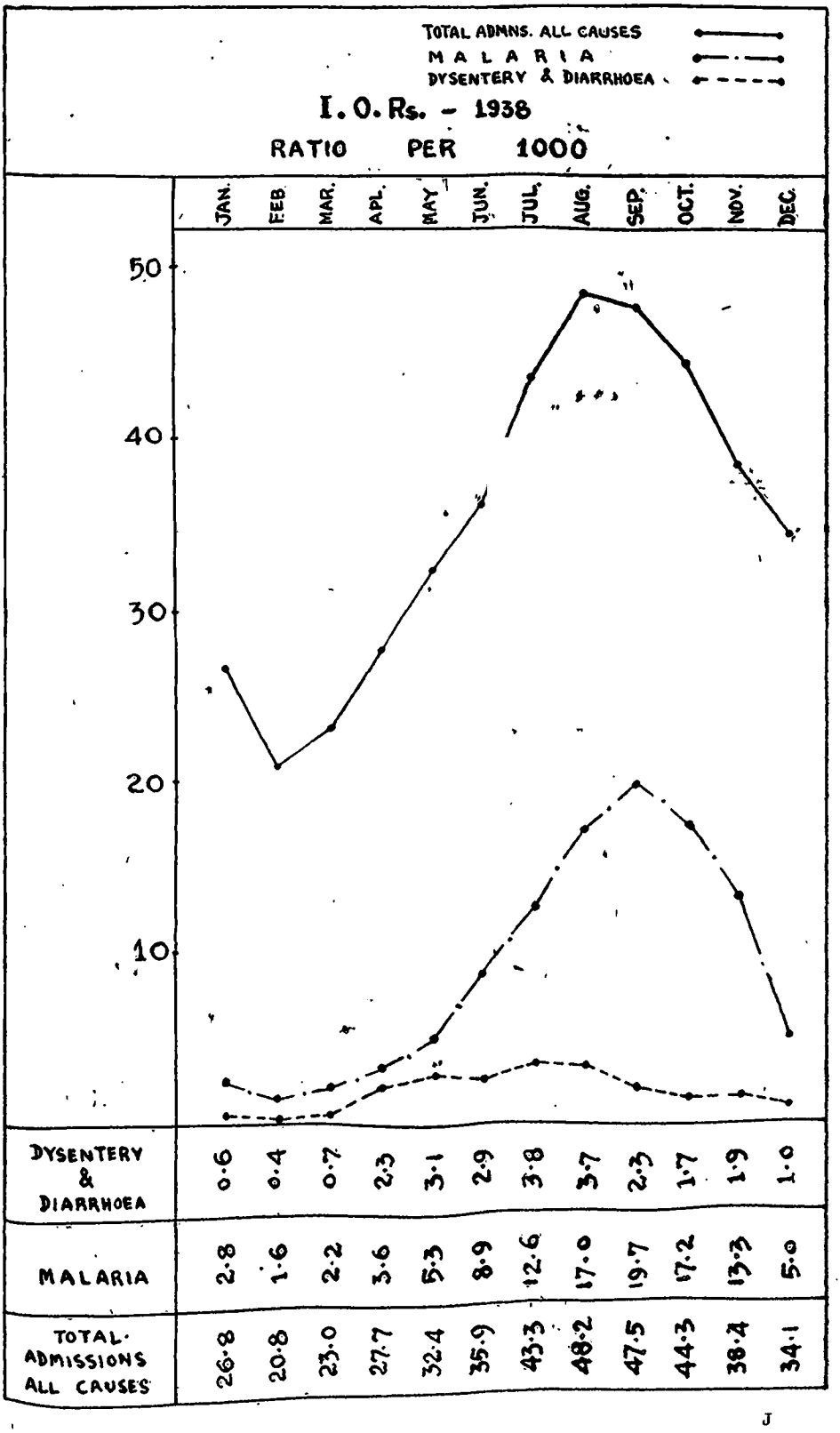
The combined ratio of constantly sick in hospital *plus* those constantly under treatment in barracks was 33·22 per 1,000 compared with 33·00 in 1937 and 34·93 in 1936. This represents the total loss per 1,000 per day.

These statistics show that the health of the Indian Army has been satisfactory throughout the year although the admission rate of 421·8 per 1,000 is n excess by 30·1 over that of last year.

In Commands the features have been a marked decrease in admissions in Western Independent District which offsets an increase in Northern Command. In the former, with 804 fewer admissions, the admission rate was reduced by 58 per 1,000. This remarkable decrease is due to that of malaria. In the latter there has been an increase of 58 per 1,000, but the health of troops is regarded as satisfactory. Troops were out on road protection duties on the Kohat-Bannu road from the beginning of June to the end of the year. The comment is made that it is remarkable how fit troops keep under these semi-war condition, even through the heat of the hot weather.

The peak of the sickness curve for all India was in August. The peak in Commands was in August in Northern, Eastern and Southern Commands; but in Western Independent District was in July and in Southern Command there were two peaks in April and August.

The graph given below shows more clearly the general trend of sickness throughout the year and for the principal diseases.



	JAN.	FEB	MAR.	APL.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
DYSENTERY & DIARRHOEA	0·6	0·4	0·7	2·3	3·1	2·9	3·8	3·7	2·3	1·7	1·9	1·0
MALARIA	2·8	1·6	2·2	3·6	5·3	8·9	12·6	17·0	19·7	17·2	13·3	5·0
TOTAL ADMISSIONS ALL CAUSES	26·8	20·8	23·0	27·7	32·4	35·9	43·3	48·2	47·5	44·3	38·4	34·1

TABLE

Table showing admission and death ratios per 1,000 of the strength for with all

Stations.	Stations with total admission ratios all causes, higher than								
	Jhansi.	Dehra Dun.	Jubbulpore.	Abbottabad.	Razmak.	Kohat.	Mir Ali.	Poona.	Roorkee.
All Causes :—									
Admissions	667·7	569·4	558·0	540·3	538·5	530·4	518·9	472·3	468·9
Deaths	0·89	2·12	0·98	4·05	4·97	1·63	2·51	1·64	0·97
Av. C. Sick.	20·66	25·70	20·56	14·07	23·51	19·88	11·14	15·52	13·74
Malaria :—									
Admissions	210·8	125·9	142·0	186·6	151·3	217·2	239·7	127·9	94·2
Deaths	...	...	...	0·74	...	0·27	...	...	...
Sandfly fever :—									
Admissions	10·7	...	...	10·7	...	1·4	9·6	...	...
Deaths	...	...	...	...	...	...	...	...	...
Enteric group :—									
Admissions	0·4	0·6	...	0·8	0·5	0·8	1·2	1·4	...
Deaths	...	...	...	...	0·15	...	...	...	...
Dysentery :—									
Admissions	48·5	8·1	25·4	13·2	44·1	14·3	4·6	28·0	4·4
Deaths	...	0·30	...	...	...	...	...	...	...
Diarrhœa :—									
Admissions	0·4	10·6	3·9	1·1	13·6	12·8	12·2	4·1	14·1
Deaths	...	...	...	...	...	...	...	...	...
Influenza :—									
Admissions	...	4·8	3·4	4·8	1·1	...	...	43·0	...
Deaths	...	...	...	...	...	...	...	...	...
Pneumonia Lobar and Lobular :—									
Admissions	1·8	4·5	3·4	9·6	5·1	5·2	3·8	1·9	4·4
Deaths	...	...	...	1·84	0·75	0·27	0·84	...	0·49
Venereal Diseases :—									
Admissions	5·8	16·9	12·2	7·7	4·1	3·5	5·4	14·0	2·9
Deaths	...	...	...	...	...	...	...	...	...
Minor Septic Diseases :—									
Admissions	57·6	66·0	46·3	48·6	31·3	26·6	26·0	30·1	65·0
Deaths	...	...	...	0·37	...	...	...	...	...
Local Injuries :—									
Admissions	106·3	87·4	74·1	53·4	76·6	56·2	61·6	62·2	101·5
Deaths	...	0·91	...	...	2·71	0·81	0·84	0·82	...
Heat Strokes :—									
Admissions	...	...	...	...	...	...	...	...	...
Deaths	...	...	...	...	...	...	...	...	...
Heat Exhaustion :—									
Admissions	...	0·3	...	...	...	0·3	1·3	...	...
Deaths	...	...	...	...	...	...	...	...	...
Ankylostomiasis :—									
Admissions	2·2	4·5	1·0	1·1	6·3	6·2	2·5	2·7	1·5
Deaths	...	...	...	...	...	...	...	...	...
Pulmonary Tuberculosis :—									
Admissions	2·2	2·1	...	2·6	0·5	4·3	2·1	3·0	1·9
Deaths	...	...	...	...	0·15	...	...	...	...

7.

all causes and certain important diseases for important stations compared India.

all India.	Stations with total admission ratios all causes, lower than all India.										
	Rawalpindi.	Nowshera.	All India.	Fort Sandeman.	Lahore.	Trimulgerry.	Bangalore.	Wana.	Quetta.	Peshawar.	Ambala.	Meerut.
	462·1	430·5	421·8	416·2	376·0	868·3	363·4	354·6	351·2	346·9	336·8	284·6
	3·02	2·77	2·21	0·02	3·47	1·89	2·22	1·02	2·98	2·46	1·21	3·37
	18·26	14·27	15·78	12·32	16·21	13·25	18·75	18·87	17·87	15·39	12·98	13·73
	159·8	53·4	109·7	168·1	87·2	19·6	22·2	100·2	82·5	106·0	40·2	64·5
	...	...	0·05	0·46	...	...	...	...	...	...	...	...
	5·8	4·7	4·6	1·4	...	...	...	...	7·6	22·6	...	...
	...	...	...	...	...	...	...	...	...	...	...	...
	0·6	0·8	0·7	0·5	1·7	0·4	1·1	0·3	1·5	0·4	0·4	1·7
	0·23	...	0·07	...	0·43	...	...	...	...	...	...	0·84
	19·1	11·9	17·3	15·7	16·5	24·2	13·9	7·2	25·2	22·2	16·4	15·6
	0·23	...	0·03	...	...	...	...	...	...	...	...	...
	4·4	6·3	7·5	5·5	14·7	8·7	8·9	9·7	10·8	5·1	4·0	7·2
	...	...	...	...	...	...	...	...	...	...	...	...
	3·3	3·2	4·4	...	...	11·0	0·7	5·9	...	0·8	...	...
	...	...	...	...	...	...	...	...	...	...	...	...
	9·3	6·3	5·0	1·8	7·4	0·8	3·3	5·6	3·7	5·1	7·6	3·8
	1·16	0·40	0·43	...	0·43	...	...	0·26	0·69	0·57	0·40	...
	7·2	3·6	7·5	4·6	7·8	8·7	22·2	3·3	8·7	7·2	6·8	7·2
	...	...	...	...	...	...	...	...	...	...	...	...
	32·3	58·2	34·1	27·3	36·4	34·0	39·1	36·6	10·3	23·1	37·4	13·9
	...	...	...	...	...	...	...	...	...	...	...	0·42
	46·0	56·2	59·8	56·8	54·2	91·4	80·1	85·3	40·8	34·9	58·3	43·0
	0·23	1·58	0·54	0·46	0·43	0·76	0·37	0·76	0·46	0·19	...	0·84
	...	0·4	0·0	...	...	...	...	...	...	0·2	...	...
	...	...	0·01	...	...	...	...	...	...	0·19	...	...
	...	2·9	0·2	...	0·4	...	0·4	...	...	...	0·4	...
	...	...	...	...	...	...	...	...	...	...	...	...
	10·7	11·1	4·3	2·3	1·7	2·3	2·6	1·8	8·7	1·9	8·4	8·4
	...	...	...	...	...	...	...	...	...	...	...	...
	3·0	0·8	1·7	2·3	2·6	1·9	0·4	0·3	0·9	1·9	2·4	...
	0·23	...	0·12	...	...	...	...	...	0·23	0·57	...	0·42

PRINCIPAL DISEASES AFFECTING THE INDIAN ARMY

40. Principal interesting features of the year

(*a*) The remarkably small admission rates in Waziristan although war conditions were in operation practically throughout the year.

(*b*) The continuance of the low admission rates for malaria. There has however been an increase on the very low rate of the previous year.

(*c*) The continued downward trend of sandfly fever and the remarkable reductions achieved in Northern Command particularly at Landikotal.

(*d*) Although cholera spread into epidemic proportions in eastern and northern India, extending from Assam to the Afghanistan border, the number of army cases was limited to 42 of which 38 cases occurred in a sudden outbreak amongst troops travelling into Waziristan.

(*e*) Scabies shows an unusual figure of 10·47 per 1,000 in Northern Command being an increase of 3 per 1,000. The all-India figure is 11·2.

(*f*) Climatic conditions have not been markedly unfavourable except for the late warm weather which carried malaria far into the autumn, the rainfall in Southern Command which appears to have been extremely favourable to malaria round Mhow and the absence of rain in the Quetta area which though favouring large scale mosquito breeding was accompanied by a marked fall in malarial incidence in military and civil populations.

41. Malaria

Amongst Indian troops the admission rate has been 109·7 per 1,000 compared with 97·9 of 1937 and 121·3 of 1936.

From over 12,000 cases there were 6 deaths compared with 4 of the previous year and 8 of 1936.

The reduction in this disease over the past 10 years is well shown in the table.

TABLE 8

Annual admission for malaria—Indian troops

Over 10 years

Year.	Ratio per 1,000. Admissions.	Invaliding.	Deaths.
1929	175·3	0·22	0·15
1930	153·4	0·06	0·13
1931	149·4	0·08	0·10
1932	145·1	0·07	0·10
1933	212·2	0·05	0·06
1934	156·5	0·06	0·05
1935	125·9	0·03	0·08
1936	123·1	..	0·07
1937	97·9	..	0·04
1938	109·7	0·04	0·05

The incidence of the various types of malaria by Commands is shown below :—

TABLE 9

Admissions and deaths for malaria by Commands

Ratio per 1,000.

Commands.		Admissions and Deaths.			
		B. T.	M. T.	Quartan.	Clinical.
Northern Command	A.	89·4	33·7	0·5	7·7
	D.	..	0·05	..	..
Western (I.) District	A.	61·9	21·0	..	4·0
	D.	..	0·09	..	..
Eastern Command	A.	60·4	23·8	..	5·9
	D.	..	0·04	..	0·04
Southern Command	A.	52·4	18·9	0·1	6·7
	D.	..	..	..	..
All India	A.	73·4	27·5	0·3	6·7
	D.	..	0·04	..	0·01

The principal stations in which the admission rates were over 100 per 1,000 are shown in the following table which gives large stations and small stations.

TABLE 10

Stations with malarial ratio over 100 per 1,000

Large stations.		Small stations.	
Mir Ali	239·7	Jhelum	309·8
Kohat	217·2	Thal	264·1
Jhansi	210·8	Baroda	239·4
Abbottabad	186·6	Shagai	231·8
Fort Sandeman	168·1	Mhow	210·2
Rawalpindi	159·8	Bannu	208·2
Razmak	151·3	Bakloh	174·8
Jubbulpore	142·0	Dharamsala	172·6
Poona	127·9	Ahmedabad	164·2
Dehra Dun	125·9	Malakand	157·3
Peshawar	106·0	Mardan	155·9
Wana	100·6	Almora	139·9
Quetta	82·5	Midnapore	124·7
Newshera	53·4	Lansdowne	111·7
		Shillong	111·3

The influence of the 1937 Waziristan operations on the malaria in distant stations is shown by the increase in malarial relapse at Jhansi and Jhelum. At the latter there was a marked contrast in relapse incidence amongst troops which had been in the station all last year and others who had returned from the Waziristan operations, there being a sharp rise in the relapse admissions in the latter. In Northern Command in general there was a rise of 34 per 1,000 in admissions, but the rate is still the second lowest in the past 10 years. There is however no tendency to obtain the spectacular drop recorded for British troops in whom the rate is one fifth that of 15 years ago. The greater opportunities for infection away from the shelter of barracks and from the relative safety of cantonments must account for this.

The wave of incidence was prolonged into the autumn in Northern Command owing to abnormal warm weather. In Eastern Command there was a similar delayed fall in the occurrence of cases.

In Southern Command malaria was the commonest of all diseases in 9 out of 13 stations.

In Western Command admissions have fallen below 100 per 1,000 for the first time on record, the rate being 86·9 per 1,000 in place of 161·89 per 1,000 of the previous year. Hindubagh gives a good example of what can be done, the admissions being reduced from 471 to 232 by concentrated, intelligent action and the expenditure of Rs. 100. Spraying played a prominent part in this. It was remarkable this year how malarial admissions fell away in August and September.

	1937.	1938.
Admissions in August	32·0	14·5 per 1,000.
Admissions in September	54·8	13·6 „ „

The fall is attributed to concentrated anti-malarial measures in which spraying played a large part. It should be noted however that there was a marked decrease in malaria in the civil population.

42. Sandfly fever

With the admissions for this disease down to 517 for the whole of India there has been a continuation of the downward trend. The incidence in the principal districts affected by this disease has been as follows.

TABLE 11

Comparative Table of Sandfly fever in Districts

	Ratios per 1,000.	
	1937.	1938.
Rawalpindi District	18·0	7·6
Peshawar District	15·6	14·2
Sind Brigade	12·7	7·3
Zhob Ind. Brigade	10·9	4·4
Kohat District	8·0	1·8
Baluchistan District	7·1	5·8

It is observed that the reduction has been in the Northern Command, particularly in Rawalpindi District, and the Command figures over 10 years are worth quoting.

TABLE 12

Sandfly fever in Northern Command

1929	36·04	per 1,000.
1930	21·54	
1931	27·46	
1932	27·56	Spraying and fumigation as an anti-malarial measure in certain stations.
1933	16·53	
1934	14·85	
1935	18·83	
1936	18·43	Spraying campaign intensified as an anti-sandfly and anti-mosquito measure.
1937	10·65	
1938	7·10	

The figures for Landikotal, that hot bed of sandfly fever, are perhaps even more remarkable.

Sandfly fever in Landikotal

1934	224	cases.
1935	239	„
1936	97	„
1937	27	„
1938	19	„

This startling reduction amongst Indian troops may, to some extent, be due to the fact that those forming the garrison during the year came from other parts of the Peshawar district and were presumably "salted" troops, but more of the decrease is really attributable to the use of "Pyefly" spraying in barracks, to the whole hearted co-operation of the troops in anti-sandfly measures and to the replacement of the old mud buildings by good modern stone or concrete and the canalisation and making "pukka" of nullahs where feasible.

The all-India incidence is shown below.

TABLE 13

Sandfly fever

	Ratios per 1,000.
1934	8·3
1935	7·5
1936	10·6
1937	6·0
1938	4·6

43. Dengue

The all India incidence has fallen to 1·1 per 1,000.

TABLE 14

Dengue

1934	2·5	per 1,000.
1935	3·4	
1936	2·6	
1937	5·0	
1938	1·1	

The stations chiefly affected were in Eastern and Southern Commands.

	1937.	1938.	
Dacca	548·7	..	per 1,000.
Alipore	137·6	..	
Bangalore	30·8	10·2	
Madras	31·1	170·9	

There was no epidemic in Bengal this year, but the rise in Madras is remarkable.

44. Fevers of the Typhus Group

There were only 38 cases amongst Indian troops compared with 43, 48, 45 and 51 of the previous years. In all there were 52 cases amongst Indian personnel, 29 of which were from Northern Command and 14 and 9, respectively from Southern and Eastern Commands. The details have been considered in paragraph 9 of Section I.

45. Enteric Group of fevers

The comparison of these diseases has been considered under paragraph 10, Section I. The decline in incidence has been maintained for Indian troops, the admissions being 86 this year.

TABLE 15

Case incidence of Enteric Group of fevers—Actual admissions

1934	224
1935	166
1936	78
1937	88
1938	86

From these 86 cases there were 8 deaths the case mortality being 9·3 per cent. compared with a case mortality of 10·2 and 6·4 for the two previous years.

The inoculation state of Indian troops is satisfactory, the figures of the half-yearly return in October being :—

Percentage protected : B. Os. 92·0, I. O. Rs. 97·8, Followers 98·8.

The relative incidence, deaths and case mortality amongst protected compared with unprotected is given below.

TABLE 16

Comparison of incidence in Protected and Unprotected

	Ratios per 1,000.		
	Cases.	Deaths.	Case mortality.
Protected	0·6	0·05	8·33
Unprotected	5·6	0·80	14·29

There was a small outbreak of 6 cases in a training battalion at Sialkot. No source of infection was traced.

One very interesting case of a very persistent carrier was treated with antogenous vaccines in Quetta. His discharge was being contemplated until the vaccine cleared him.

46. Dysentery, Diarrhœa, Colitis and Amoebic Hepatitis

This group shows little signs of real reduction. As with British troops, so with Indian the proximity of bazaar areas, suddar and municipal, plays a predominant part in these fly borne infections. Indian troops frequent and buy food stuffs in these bazaars, but have the counteracting factor of relative immunity compared with British personnel.

TABLE 17

Dysentery, Diarrhœa, Colitis and Hepatitis

	Ratios per 1,000.				
	Dysentery.	Diarrhœa.	Colitis.	Total.	Hepatitis.
1933	15·3	7·9	0·3	23·5	0·6
1934	13·9	6·3	0·2	20·5	0·7
1935	12·2	5·6	0·2	17·9	0·5
1936	11·0	6·2	0·3	17·5	0·6
1937	12·4	5·4	0·4	18·3	0·5
1938	17·2	7·5	0·2	24·9	0·6

Admissions for different types of dysentery remain very much the same. They are given below.—

	Actuals.	Percentage of cases.
Dysentery, protozoal	88	4·56
Dysentery, Bacillary, proved	1,183	61·26
Dysentery, Bacillary, exudate	248	12·84
Dysentery, Clinical	412	21·34

The case mortality on the total of admissions was 0·15 per cent. The distribution by Commands is given in the table below.

TABLE 18

Dysentery by Commands

Commands.	Ratios per 1,000.			
	Amœbic.	Bacillary, proven.	Bacillary, Exudate.	Clinical.
Northern	0·7	9·9	2·1	4·2
Western	0·5	10·1	2·6	5·6
Eastern	1·0	11·6	1·8	2·1
Southern	1·0	11·3	2·9	3·1

In Southern Command at Bangalore of 38 cases 17 or 45 per cent. were protozoal in type.

Jhansi had the highest incidence for Indian troops in Eastern Command as for British troops and the cause is again stated to be due to fly infestation.

In Northern Command at Razmak an epidemic occurred from the middle of April to the end of May, coincident with the break down of the refuse destructor and a depletion of sanitary personnel owing to "Columns". Strict sanitary control was established early in May, and the epidemic reaching its peak on 7th-8th May subsided, but tended to reappear throughout the year. In all there were 293 cases here.

At Ambala the regimental bania was found to be a strong carrier of B. dysenteriæ Flexner.

47. Cholera

In spite of the wide spread and in places, severe epidemic amongst the civilian population, (see paragraphs 5 and 40), there were in all only 42 cases amongst Indian military personnel. In the previous 10 years there have only been 1 or 2 cases in each year and the present group of cases is due to one isolated outbreak in Waziristan.

The Waziristan outbreak.—Forty-one cases with 2 deaths occurred in a Gurkha battalion on their arrival at Razani from Abbottabad on the 15th August. The outbreak was dealt with by an isolation camp on the spot and exceedingly energetic, preventive measures ; and was completely controlled by the 20th. The cases were scattered throughout the unit, not confined to one company. Careful investigation throughout the whole course of the journey failed to discover the source.

48. Diseases of the Digestive System

There were 5,794 admissions for this group of diseases with 21 deaths and 8 invalids compared with 4,426 admissions and 9 deaths in the previous year.

The most important diseases of this group were :—

TABLE 19

Admissions for diseases of Digestive system.—Actuals

	Admissions.	Deaths.	Invalids.
Pharyngitis	2,163	..	..
Tonsillitis	682	..	..
Diarrhœa	842	..	..
Indigestion	584	..	..

A comparison of some of the principal diseases over the past three years is given below.

TABLE 20

Diseases of the Digestive system

	Ratios per 1,000.				
	Tonsillitis.	Pharyngitis.	Gastritis.	Dyspepsia.	Jaundice.
1936	5·9	20·6	1·3	3·7	2·2
1937	5·8	16·1	1·0	4·1	1·9
1938	6·1	19·3	1·1	5·2	2·1

There were 234 cases of jaundice this year, the cases being of the catarrhal type with no obvious infective cause.

Taenia infections.—The number of admissions for infection by the tape worms was 42 this year compared with 40 of last year. In the present year the main types were T. saginata 29 cases and T. solium 7 cases. The greatest number of cases of T. solium *viz.* 4 were admitted in Eastern Command.

Ankylostomiasis.—There were 483 admissions for this, the majority being in Northern Command at Nowshera, Peshawar, Kohat, Rawalpindi, Ambala, Sialkot, Jhelum, Razmak and Bannu.

At Nowshera in Peshawar District recruits in a Sikh Regiment were found to be very heavily infected on routine examination. Treatment was carried out for all and in 62 men the average increase in weight was 9½ lbs. with marked improvement of the condition of the trained recruits sent to their units. The Director of Public Health of the Punjab was informed and arrangements were made by him for an *anti* hookworm campaign in the Ludhiana area and chlorination of certain wells in the Campbellpore District from which these infected recruits had come.

49. Cysticercosis

There were no admissions during the year amongst Indian troops or Followers.

50. Oriental sore

There were 95 admissions for this condition, but a large number are treated as out-patients. This has been referred to in paragraph 15, Section I.

In Quetta the condition had given rise to serious anxiety after the heavy incidence of 1936 and a special grant of Rs. 2,000 was made for preventive measures.

The incidence in three years has been :—

	British troops.	Indian troops.
1936	63	448
1937	37	165
1938	53	391

A strenuous spraying campaign is to be carried out during 1939 to endeavour to control this very considerable cause of inefficiency, while protection of sores from sandflies or other flies is being ensured by means of plaster covering.

A method of treatment by means of infra-basal injections of atebrin beneath the sore is said to have given good results amongst the labourers at the Coolie camp.

TABLE 21

Oriental sore : admissions over 10 years.—Actuals

1929.	1930.	1931.	1932.	1933.	1934.	1935.	1936.	1937.	1938.
28	53	150	58	53	103	67	172	135	95

51. The Minor Septic and Local injuries Group of diseases

This prolific combined group produced a total of 15,577 admissions in the year for British and Indian troops.

TABLE 22

Annual comparison of Minor Septic and Local injury Group

Ratios per 1,000.

Year.	Minor Septic diseases.	Local injuries.	Cellulitis.	Boils.
1936	33·4	52·6	24·5	6·0
1937	31·4	51·8	23·5	5·4
1938	34·1	59·8	25·5	5·9

There is no indication of any decrease in the admissions for this group.

52. Venereal diseases

This group accounted for 837 admissions compared with 812 of the previous year.

TABLE 23

Comparison of groups of venereal diseases.—Actuals

Diseases.	Admissions.			Percentage.	
	1936.	1937.	1938.	Increase.	Decrease.
Gonorrhœa	561	338	322	..	0·05
Syphilis	397	300	344	0·01	..
Soft chancre	181	172	171	..	0·02

The tendency for the *admissions* for the total venereal diseases amongst Indian troops and followers to remain at a low level is well illustrated by the following :—

TABLE 24

Annual comparison of total venereal

	1929.	1930.	1931.	1932.	1933.	1934.	1935.	1936.	1937.	1938.
Total venereal .	1670	1425	1349	1288	1275	1130	1186	1142	812	837

The drop of admissions of the past 2 years may well be due to increasing resort to private treatment in the Bazaar.

53. Small-pox

The incidence is practically constant at 22 admissions this year and is remarkably small considering the population at risk. The vaccination state is very high : 98·8 per cent. being fully protected at the half yearly October census.

TABLE 25

Annual comparison of smallpox. Actuals

1934.	1935.	1936.	1937.	1938.
23	22	20	16	22

Cases were extremely scattered, only Peshawar (3), Kohat (3), Jullundur (2) having more than one case.

54. Cerebro spinal fever

There were 23 cases of which only 4 occurred outside Northern Command. The seasonal incidence and location are best shown by the table below.

TABLE 26

Cerebrospinal fever among I. Os. and I. O. Rs. (1938).—Actuals

	Landikotal.	Kohat.	Abbottabad.	Lahore.	Sialkot.	Razmak.	Wana.	Bannu.	Jhansi.	Meerut.	Lucknow.	Ahmedabad.
January	2	..	..	1	2	..	..	1	..	..	..	..
February	1	..	..	2	2	1	..	..	..	..	..	..
March	1	..	..	..	..	..	1	..	..	..	..	..
April	..	..	..	..	..	..	..	..	..	..	..	..
May	1	..	..	..	..	..	..	..	..	..	..	..
June	..	..	..	..	..	..	..	..	..	..	..	..
July	..	..	..	..	1	..	..	..	..	..	..	..
August	..	..	..	..	..	..	..	..	1	..	..	..
September	..	..	1	..	..	..	..	..	..	..	..	..
October	..	..	1	..	..	..	..	..	..	..	..	..
November	..	..	..	..	..	..	..	..	..	1	1	..
December	..	1	..	..	..	..	..	..	..	..	..	1
Total	5	1	2	3	5	1	1	1	1	1	1	1

During the past 5 years the incidence has been :

TABLE 27.

Annual comparison of Cerebrospinal fever.

1934.	1935.	1936.	1937.	1938.
39	19	16	17	23

55. Poliomyelitis

Nil for Indian troops.

56. Diseases of the Respiratory system

The diseases of this group including pulmonary tuberculosis and pneumonia gave an incidence of 22·8 per 1,000. There were no definite epidemics until an outbreak of mild influenza commenced in December in Lahore District but the cases were mainly dealt with under barrack treatment, there being at Ferozepore 117 cases in the cavalry and training battalion and 105 at Lahore. Deaths from this group were :

Pneumonia 48, or a case mortality of 8·56 per cent.

Tuberculosis 14, or a case mortality of 7·45 per cent.

Other respiratory diseases 5, or a case of mortality of 1·20 per cent.

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Pulmonary Tuberculosis, of which there were 188 cases during the year, has given its lowest admission figure for at least 12 years in Northern Command. It is considered that the improvement may be due to better housing conditions which have been introduced since the Great War.

There were 160 Indian Officers and I. O. Rs. and 35 Followers invalided during the year for Tuberculosis.

Pneumonia and Broncho-pneumonia.—The admission rate for these remains practically constant. The total admissions were 561 with 48 deaths, Northern Command producing the highest number while in Southern Command the admissions have again decreased and are half that of 12 years ago.

TABLE 28

Annual comparison of Pneumonia.—Actuals

	1931.	1932.	1933.	1934.	1935.	1936.	1937.	1938.
Admissions .	1,078	961	730	704	576	624	514	561
Deaths . .	132	97	89	58	60	71	34	48
Percentage mortality . .	12·24	10·09	12·19	8·24	10·42	11·38	6·61	8·56

The steady decrease in cases, the more marked decrease in deaths which are a quarter of that of 1931 and the decrease in percentage mortality are gratifying. With the introduction of the sulphonamide group of drugs this disease which was so feared by Indian troops may be held even more in check.

The results of the enquiry into treatment with rectified spirit in saline on which comment was made in last year's report have shown that it has only been used in a few cases. One case, a prolonged case of pleurisy, in which tuberculosis was suspected, improved rapidly with injections of 20 c.c. of 30 per cent. alcohol every fourth day. The sulphonamide group of drugs offers much greater scope.

The incidence of the diseases of the group is best shown in table form.

TABLE 29

Annual comparison of Respiratory diseases.—Ratios per 1,000

Year.	Lobar pneumonia.	Lobular pneumonia.	Pleurisy.	Bronchitis.	Pulmonary tuberculosis.	Diphtheria.	Influenza.	Total al respiratory Diseases.
1934 .	5·0	1·0	1·8	14·3	1·8	0·1	10·5	34·5
1935 .	4·0	0·9	1·9	11·3	1·9	0·0	5·4	25·4
1936 .	4·4	0·9	1·9	11·3	1·7	0·1	7·3	27·6
1937 .	4·2	1·0	1·8	12·6	1·6	0·0	5·7	26·9
1938 .	4·0	1·0	2·3	12·4	1·6	0·1	4·4	25·8

57. Effects of Heat

There were 25 admissions which is the highest for a number of years. The admissions for 5 years are shown.

TABLE 30

Admissions for Effects of heat.—Actuals

1934.	1935.	1936.	1937.	1938.
23	18	19	27	25

The majority of cases were admitted at Nowshera (6), Risalpur (3), Mir Ali (3), Manzai (3). The use of extra salt and its possible effects have been discussed in paragraph 24 of Section I.

58. Mental Diseases

The number of admissions for this continues at approximately the same figure. The majority of cases were admitted in Northern and Eastern Commands with 46 and 29 cases.

TABLE 31

Admissions for mental diseases.—Actuals.

1934.	1935.	1936.	1937.	1938.
120	93	104	95	105

59. Followers

The admission rate at 272·0 per 1,000 is less than that of 1937 and the rate has remained remarkably constant.

TABLE 32

Admissions for Followers —Ratios per 1,000

Year.	Total admissions.	Malaria.	Sandfly fever.	Venereal diseases.	Pneumonia.	Dysentery Diarrhœa group.	Tuberculosis pulmonary.
1929	302·6	128·1	11·5	12·4	12·7	12·3	2·4
1930	250·6	86·3	6·4	11·3	11·9	14·5	2·6
1931	285·8	94·2	9·4	10·9	12·2	12·9	2·3
1932	266·4	90·7	7·4	10·3	9·9	11·3	2·2
1933	332·9	143·1	6·2	11·1	8·7	13·0	1·6
1934	287·6	102·5	4·4	10·5	10·3	12·6	1·9
1935	302·9	106·6	4·2	10·3	7·5	11·6	1·6
1936	279·1	84·1	8·6	9·8	7·8	9·2	1·7
1937	279·0	77·1	7·8	10·6	7·8	10·9	1·6
1938	272·0	74·9	4·3	9·6	7·2	12·5	1·8

TABLE 33

Principal diseases and causes of death.—Ratios per 1,000

Pneumonia	1·44
Infectious Diseases	0·31
Circulatory Diseases	0·27
Digestive Diseases	0·23
Injuries	0·31
Pulmonary Tuberculosis	0·31
Other Respiratory Diseases	0·16
Urinary Diseases	0·16
Poisons	0·16

There has been a very marked fall of 100 cases in admissions in Western Ind. District, the rate per 1,000 dropping from 376 to 283. This has been due to the reduction in malarial admissions and this reduction favours a fall in death rate.

In Eastern and Northern Command respectively the admission rates have increased 21 and 15 per 1,000. This is partly accounted for by the increase in relapses of malaria acquired in the Waziristan operations of 1937, that in Northern Command being 20 per 1,000. Compensating for this there was a marked reduction in sandfly fever which at 6·60 per 1,000 is the lowest recorded.

The dysentery-diarrhœa group increased and there were 4 cases of cholera: 2 at Razani, 1 at Kohat and 1 at Jutogh.

The death rate as usual is high, *viz.*, 3·62 per 1,000 compared with 3·96 and 3·58 per 1,000 for 1937 and 1936. This is high compared with the death rate of Other Ranks.

Officers	10·40
I. O. Rs.	2·21
Followers	3·62

This figure probably gives a somewhat erroneous idea of the relative mortality amongst this class of personnel because Followers as a whole, and the Sweeper class in particular, tend to avoid admission to hospital until necessity compels, so that only the really seriously ill form the bulk of the admissions. There is moreover the generally lower scale of *feeding* and *clothing* adopted for this class which does not enhance their powers of resistance when ill.

The Labour Camp and Hospital, Quetta.—The population of the camp has decreased as there is a tendency for the labourers to go to live in the city. The camp hospital has only had 721 admissions this year compared with 1,301 of 1937. The disinfestation centre, which has been an elaborate affair has only been used once, for a small group of men, since it was established.

Weekly medical examinations of all personnel employed are carried out in 3 centres close to the work not in the camp and daily sick parades are held at 5 centres close to the work. Vaccination has been compulsory.

Average strength	3,935	
Admissions	183·2	per 1,000.
Average daily sick	5·55	„
Deaths	2·29	„

The principal causes of admission have been as shown.

TABLE 34

Principal diseases of Labour in Quetta.—Actuals

Disease.	Admissions.	Deaths.
Malaria	173	..
Local injuries	129	..
Pneumonia	22	7
Oriental sore	19	..
Dysentery	11	1
Enteric group of fevers	10	1
Cerebrospinal fever	6	..

Workers in Arsenals.—Special attention has been drawn and paid to the conditions of work for certain classes of employees in arsenal workshops. Improvements are being made in the work of welders and painters. The main defect in many places is that of "lighting on the plane of work". This extremely important point for efficiency of production and prevention of accident is often grossly neglected, partly from habitude partly from want of attention and partly from economy. A point which is certainly not recognised in India is that "you cannot get good work from bad lighting". This applies to all classes of work and is particularly obvious in the numerous Headquarters offices and stores of the Army in India.

60. Recruiting

The total number of recruits at the recruiting centres in the year ending the 31st March 1939 was 21,088, of these 9,172 were rejected, a percentage of 43·5 compared with 35·73 per cent. of the previous year.

The principal causes of rejection of recruits for this year has been as follows.

TABLE 35

Causes of rejection of recruits.—Percentages

Disability.	Percentage rejected at recruiting centres.	Percentage rejected during training at depots.
1	2	3
Malaria (enlarged spleen)	2·7	0·05
Tuberculosis (pulmonary)	0·2	0·04
Tuberculosis (other organs)	0·0	0·06
Venereal diseases	1·8	0·03
Other diseases due to infection	0·1	0·05
Diseases of the nervous system	0·02	0·1
Defective vision	2·4	0·05
Trachoma	5·0	..
Other eye affections	1·0	0.1

TABLE 35—*contd.*

Disability.	Percentage rejected at recruiting centres.	Percentage rejected during training at depots.
1	2	3
Otitis media	3·1	0·02
Defective hearing	0·04	..
Other ear diseases	0·6	0·04
Diseases of nose and throat	0·3	..
V. D. H.	2·6	..
D. A. H.	4·3	..
Varicose veins	2·5	..
Haemorrhoids	1·2	..
Varicocele	0·8	0·01
Other diseases of circulatory system	0·04	0·01
Anæmia	0·6	..
Goitre	0·8	..
Respiratory diseases excluding tuberculosis	0·2	0·03
Pyorrhœa	1·7	..
Loss or decay of teeth	0·1	..
Hernia	0·8	..
Other diseases of digestive system	0·1	..
Ankylosis of joints	1·3	0·01
Flat feet	1·1	0·02
Knock knee	1·0	0·05
Curvature of spine	0·3	..
Other deformities	1·2	0·02
Skin diseases	1·0	0·03
Poor physique	0·1	0·03
Other causes	4·6	0·5
Total	43·5	1·4

N.B.—The figures in columns 2 and 3 are in respect of the following only :—

Cavalry.
Artillery.
Sappers and Miners.
Indian Signal Units.
Infantry.

Trachoma amongst Recruits.—The Secretary, The Indian Soldiers' Board, raised the question with the Chief Recruiting Officer, Delhi as to whether there was a real increase in trachoma in the civil population in the principal recruiting areas to account for the increasing number of promising young men who were being rejected on account of trachoma. The matter was taken up with the Public Health Commissioner who replied to the effect that a comparison of the figures for 1935, 1936 and 1937 did not suggest any abnormal increase in cases treated for trachoma in the recruiting areas of the Punjab and Delhi Province. No special measures were being taken by the Inspector General of Civil Hospitals except by means of lectures and propaganda; but that a "Blindness Week" would be held throughout the country early in 1939 to raise an intensive campaign for precautionary measures against blindness and eye diseases.

It is to be hoped that any measures adopted will bear fruit because the concern of the Indian Soldiers' Board over the apparent increase of trachoma

is fully justified by figures available from military records. The numbers rejected for trachoma at the main recruiting centres were as follows :—

TABLE 36

Quarter ending.	1936.						1937.						1938.					
	Mar.	June	Sept.	Dec.	Total.	Mar.	June	Sept.	Dec.	Total.	Mar.	June	Sept.	Dec.	Total.
Peshawar	19	62	32	30	143	12	5	4	10	31	4	7	8	14	33
Rawalpindi	59	46	59	44	202	59	45	36	8	148	8	20	27	16	71
Lahore	4	9	11	18	42	4	6	8	23	41	32	24	..	5	58
Jullundur	25	50	86	52	213	123	120	59	78	380	90	77	71	40	278
Delhi	17	20	8	50	95	165	150	334	106	865	149	109	176	128	652
Lucknow	6	18	13	6	43	1	3	7	6	17	8	4	6	2	20
Ajmer	1	..	..	..	1	1	..	..	1	2	..	1	..	..	1
Poona	..	..	2	5	7	1	..	4	..	5	1	2	..	2	5

It will be observed that comparing 1936 and 1937 the number rejected in 1937 in the Delhi recruiting area was just over 9 times that of 1936. In 1938 the number was less, but still more than 7 times the figure of 1936. It will also be noticed that there has been a marked fall in rejections in the Rawalpindi area in the three years.

Even granted that attention is focussed on the condition and that diagnosis is more accurate, there appears to be a marked increase of the condition in the recruitable population of the Delhi area.

61. Welfare Work among Indian Troops' Families

The extent of this work is again noted as increasing steadily in many stations. It is becoming more and more valued by the Indian soldier and difficulties of caste, class and religion are definitely interfering to a smaller degree.

Infant welfare work is however largely becoming merged into that of the general care of families and the provision and use of family hospitals in which are provided beds for maternity cases.

In fact comment is made in the yearly reports about this to the effect that demands for treatment and for unit or station family hospitals are more pronounced than those for infant welfare work alone. Infant welfare work is however much appreciated and has a very definite value, but the treatment of children and women bulks even more largely. Owing to this demand comment is frequently made that the time is rapidly approaching when the treatment of families of Indian troops and followers and the provision of hospitals for this purpose will have to be recognised as an obligation on central authority. The solution suggested in some cases is the allotment of a portion of the Indian military hospital for this purpose. Where spare buildings exist this may be possible; but the authorised provision of beds for troops and followers will at times be fully required and such encroachments could not be allowed.

At present, apart from certain payments of wages and provision of personnel, the whole welfare and families treatment system is run by voluntary effort, by subscription from units, by donation from central charitable funds and by the personal support, both physical and financial, of the wives of officers of the units concerned. In addition a great deal of voluntary work is given by Medical Officers and members of the I. M. D.

The opinion of medical officers is that the whole movement is worth while, not only from the point of view of immense improvements in the physical conditions of the families, but also from the beneficial effect on the troops concerned.

Three years ago those controlling welfare centres were asked to compile daily registers of the work done and to include these in an annual report for which a proforma was issued. At the end of 1938 a further questionnaire was issued asking for comments on specified lines and in reference to specified diseases. These have been incorporated in the present annual reports to a modified degree, but will be included more fully for 1939. Further details are best discussed in the order given in this questionnaire.

(*a*) *Approximate average strength of women and children.*

Women.	Children.
24,225	30,808

(*b*). *Approximate numbers dealt with by welfare centres.*—Attendances are entered in the daily registers for in-patients and out-patients. A check has to be maintained on these to ensure that the total of patients shown is not the sum total of attendances. Comment is also made in reports that in many cases the present figures given as to the numbers of diseases are very fallacious, because the diagnosis rests with the nurse or even untrained assistants. The number of attendances varies considerably, the more popular the centre the greater the attendances.

In fact, in the case of the A. T. T. Company at Meerut, which from a hygienic point of view is the best cared for unit in the station, it would be quite possible to argue from the large number of cases attending the Centre that attention to hygiene has a markedly deleterious influence on the health of families.

The numbers attending at all centres were approximately :

Women.	Children.
84,677	100,367

(*c*). *Progress of the work done.*—The crux of the work is really the money which can be secured by any particular station for the purpose. The tendency is for the scope of the work to increase whenever funds make this possible and the demand for treatment and for beds is often in excess of those available. In several big stations the work has been hampered by moves of personnel and the difficulty there is in securing lady sub-assistant surgeons and qualified trained nurses who will take the appointments or who are suitable. For example at Mhow and at Bannu the lady S. A. S. left and was not replaced for months with consequent difficulties in keeping the work going.

A lady S. A. S. or trained nurse who fits into the job is invaluable and such have proved their worth in many stations such as Multan, Abbottabad, Chaklala, Meerut, Roorkee, Bakloh and Bangalore. At Jubbulpore and one or two other places a private lady doctor carries out the work.

In reference to the work of such a lady S. A. S. the Officer Commanding the hospital at Roorkee comments as follows :—

> " There is no doubt that the treatment side of this work has a most beneficial effect on the health of the troops ..... diseases are less ..... and I can only assume that the Indian Troops Family Hospital has played its part."

(*d*). *Accommodation.*—The majority of welfare centres are established in converted, reappropriated quarters in the lines of the unit concerned. In some places special buildings have been provided to form a families hospital at which the welfare work is also carried out. Such exist at Peshawar, Jullundur, Risalpur, Kohat, Ferozepore, Roorkee, Almora and Bangalore while at others such as Bannu and Abbottabad reappropriated hospital buildings in connection with the Indian Military Hospital form much needed family hospitals. The standard of accommodation at some of these family hospitals and of their fittings is excellent, but at all there is a continued demand for increased beds. The average bed accommodation in the converted quarter type of combined centre is usually from 4—6 beds *plus* two beds for lying in cases.

In some stations such as Karachi, Rawalpindi, Baroda and Meerut welfare centres provide only outdoor treatment and arrangements exist with the neighbouring Mission Hospital or Cantonment General Hospital or Civil Hospital for admission of hospital cases.

The criterion for the establishment of a true families hospital should however be the ability of the garrison to bear the cost of maintenance, apart from the easier question of initial cost.

In addition to the provision of welfare centres and family hospitals greater amenities for women and children are being progressively provided in the form of children's playgrounds and schools, purdah gardens for the women and even hot water bathing establishments. At one station, Roorkee, a school opened for 20 children was inundated at once with 50 applicants.

In all there are some 80 centres now established—Northern Command 22, Southern Command 27, Eastern Command 26, and Western Ind. District 5.

(*e*) *Staffs.*—There are in all 18 lady sub-assistant surgeons and one male sub-assistant surgeon employed on this work and paid from funds controlled by Army Headquarters, 12 from Government funds and the remainder from the Indian Expeditionary Force Canteen Profits Fund. The difficulty experienced in several stations in obtaining reliefs for lady sub-assistant surgeons during the year have already been noted.

In addition, in all stations trained nurses and assistants, health workers and trained *dais* are employed according to the funds available. In more than one station civilian lady doctors give their services and in every station the wives of officers voluntarily do an immense amount of work for the maintenance of these centres.

(*f*) *Funds.*—In the majority of centres subscriptions from the men, from unit funds and from officers and their wives form approximately two-thirds to three-quarters of their resources. Grants-in-aid are given proportionately from the Indian Red Cross Society central association to the limit of the funds available.

(*g*) *Confinements.*—Where centres have beds available, reports indicate that women are tending more freely to use such accommodation for their confinements and comment is made on the improvements observed from this practice. The degree to which centres are used for confinements depends to a great extent on the capabilities and personality of the nurse in charge.

(*h*) *Principal diseases—General.*—Comment is made that diagnoses are often merely on clinical grounds and are probably inaccurate, being based on the nurses' knowledge or imagination; but with greater supervision and registration of cases improvements are observed.

Malaria.—Cases of this disease form a large proportion of the patients and where laboratory facilities exist or a clinical side room is available many cases are diagnosed on microscopical findings. For example at Jubbulpore of 220 cases with no deaths, 50 were proved by blood examination, at Multan all cases treated were examined by blood slides, at Abbottabad 139 of which 94 were admitted, at Rawalpindi nearly all cases were examined by blood films.

Spleen examination of children is a routine measure in some stations and positive cases are placed on treatment.

In several instances a direct correlation between malaria in the soldier and his family has been established.

Dysentery and Diarrhœa.—Considerable numbers of these are reported as having been treated. Amongst young children a tendency for parents

to bring them late in the disease is mentioned in some stations with consequently a higher mortality rate. A seasonal incidence, spring and mid-summer, corresponding to the fly prevalence, has been particularly noted at many stations; but no marked correlation of families' cases to troops' cases has been observed in the majority of reports.

Attention to home-visiting and advice on the improvement of local sanitation is mentioned in many reports.

Diagnoses are made usually on clinical grounds except in the case of in-patients when laboratory facilities are available.

Enteric group of fevers.—Treatment and isolation of cases is recorded from families' hospitals at Kohat, Chaklala, Abbottabad, Bakloh and Bangalore. T. A. B. inoculations of women and children is obtained in many stations.

Tuberculosis.—In 14 stations 2 or more cases diagnosed by sputum examinations are recorded. In all cases steps are taken to isolate the infective person. In a number of instances subsequent sanatorium treatment has been obtained for the patient, in others they have been sent away to their homes, advice as to risks of infection being given before dispatch.

Eye cases.—Many cases are seen and comment is made in several reports that in these conditions much benefit is observed. Trachoma cases are specially noted from Rawalpindi, Jhelum and Jullundur.

In many places the more serious cases are seen by the eye specialist.

Respiratory diseases.—The beneficial results from proper treatment particularly for cases of pneumonia as in-patients is specially noted in several reports.

Infectious diseases.—Where hospital facilities exist isolation of measles and diphtheria has been carried out. At Kohat diphtheria in a family, proved by laboratory examination, was traced to the father who was proved to be a virulent carrier. He was cleared by six weeks' treatment.

A list of principal diseases with num

TABLE

Statement showing work done

Commands.	Malaria.	Dysentery.	Enteric fevers.	Enteritis and Diarrhœa.	Other digestive diseases.	Tuberculosis.
Northern—						
Admissions—						
Women	227 (3)	40	20 (2)	42	58	42 (5)
Children	136 (6)	31 (2)	18	230 (25)	44 (2)	9 (2)
Out-patients—						
Women	1,565	396	12	1,112	6,295	112 (3)
Children	2,009 (1)	560 (3)	37 (2)	3,688 (6)	5,051 (3)	41 (3)
Eastern—						
Admissions—						
Women	102	49 (1)	3	24 (3)	94	10 (5)
Children	116 (1)	67 (9)	9 (1)	227 (29)	75 (3)	5 (2)
Out-patients—						
Women	1,626	178	34	619	6,498	23 (4)
Children	1,405 (2)	320	72	2,073 (2)	3,991	4
Southern—						
Admissions—						
Women	49 (1)	19	2	21	23	4
Children	27	14	...	21	10	...
Out-patients—						
Women	1,737	186	13	877	4,079	57 (5)
Children	2,320	282 (7)	15 (2)	2,755 (2)	4,888 (3)	53
Western Independent District—						
Admissions—						
Women	12	8	...	3	2	...
Children	11	7	...	15 (4)	4	1
Out-patients—						
Women	27	16	...	21	48	2
Children	21	13	...	77	55	2
All India—						
Admissions—						
Women	480 (4)	116 (1)	25 (2)	90 (3)	177	61 (10)
Children	290 (7)	119 (11)	27 (1)	493 (58)	133 (3)	15 (4)
Out-patients—						
Women	4,955	776	59	2,629	17,220	194 (9)
Children	5,755 (2)	1,175 (10)	124 (4)	8,593 (10)	13,985 (6)	103 (1)

Figures in brackets

bers of cases treated is given below.

37.

in Army Child Welfare Centre, (Indian Troops) 1938

Pneumonia.	Other respiratory diseases.	Diseases of the eyes.	Parturition.	Effects of parturition.	Generative system.	Minor septic diseases.	Total all causes.
27 (1)	49 (1)	61	632 (2)	140 (4)	153	45	1,949
159 (25)	222 (8)	110	...	...	14	77 (1)	2,551
28	3,766	2,199	394	918 (1)	2,363	1,145	28,878
186 (12)	6,366	4,979	...	...	77	1,906 (1)	36,833
16 (2)	63	50	247	79	221	31	1,334
144 (25)	170	78	...	...	...	51	3,449
14	2,739 (1)	2,630	328	726 (1)	2,399	403	27,999
98 (5)	7 (4)	4,714	...	... (1)	136	972 (4)	28,388
4 (1)	23	1	332	54	26	10	631
21 (1)	17	14	...	...	...	13	249
10	3,021	2,097	250 (1)	581	933	901	23,349
78 (17)	4,788 (2)	2,418	...	... (1)	32	1,431	31,037
...	7 (1)	4	30	6 (1)	...	1	119
2	24	6	...	...	1	6	112
2	39	26	64	15	...	11	418
2 (2)	137	89	...	...	1	74	748
47 (4)	142 (2)	116	1,241 (2)	279 (5)	400	87	4,033
326 (51)	433 (8)	208	...	...	12	147 (1)	3,361
51	9,565 (1)	6,952	1,036 (1)	2,240 (2)	5,695	2,660	80,644
364 (36)	11,298 (6)	12,200	...	... (2)	246	4,383 (5)	97,006

indicate deaths.

Deaths—	
Women	66
Children	320

APPENDICES.

SECTION I.

BRITISH TROOPS, 1938.

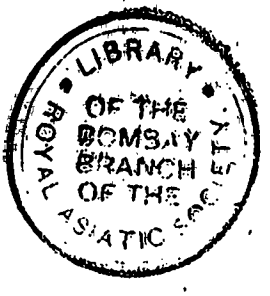

TABLE A

Stations by Commands and Independent Districts.

Stations.	Height above M. S. level in feet.	Authority for height.	Points of reference.
Northern Command.			
Abbottabad	4,010	S. D.	Map.
Ambala	902	,,	S. B. M.
Amritsar	754	,,	,,
Bannu	1,250	,,	Map.
Barian Camp and Khyragali	7,133	I. B.	..
Campbellpore	1,180	S. D.	Map.
Cherat	4,546	,,	,,
Dagshai	6,087	,,	,,
Dalhousie Convalescent Depot	7,687	,,	,,
Dera Ismail Khan	568	,,	S. B. M.
Ferozepore	649	,,	,,
Gharial	6,811	S. G.	,,
Jhelum	762	S. D.	,,
Jullundur Cantonment	771	,,	B. M.
Jutogh	6,370	,,	Map.
Kalabagh and Baragali	7,963	,,	,,
Kalabagh and Mari Indus	682	,,	,,
Kasauli Convalescent Depot	6,050	,,	..
Kohat	1,725	,,	Map.
Khanspur and Ghora Dhaka	7,721	,,	,,
Kuldana	7,049	S. G.	,,
Lahore Cantonment and Fort	706	S. D.	S. B. M.
Landikotal	3,509	,,	Map.
Lockhart Fort	6,613	,,	,,
Manzai	1,650	,,	,,
Mir Ali	2,240	S. G.	V. G. L.
Multan	404	S. D.	S. B. M.
Murree Convalescent Depot	7,073	,,	Map.
Nowshera (Railway Station)	966	,,	B. M.
Peshawar	1,152	,,	S. B. M.
Rawalpindi	1,689	,,	,,
Razmak	6,556	,,	Map.
Risalpur	1,014	,,	B. M.
Sialkot	829	,,	,,
Solon	5,078	,,	,,
Sabathu	4,000	,,	Map.
Thall	2,450	,,	,,
Wana	4,530	S. G.	V. G. L.
Western Command.			
Hyderabad	96	S. D.	S. B. M.
Karachi (Holy Trinity Church)	28	,,	,,
Quetta	5,510	,,	,,

TABLE A—*contd.*

Stations.	Height above M. S. level in feet.	Authority for height.	Points of reference.
Eastern Command.			
Agra (Fort)	525	S. D.	S. B. M.
Allahabad and Fort	314	,,	,,
Bareilly	563	,,	,,
Barrackpore	24	,,	,,
Benares	256	,,	,,
Cawnpore	407	,,	B. M.
Chakrata	6,885	,,	Map.
Dacca	20	M. D.	,,
Dehra Dun	2,232	S. D.	S. B. M.
Delhi	757	,,	,,
Dinapore	170	,,	Church.
Fort William	17	S. G.	..
Fyzabad	330	S. D.	S. B. M.
Jhansi	849	,,	,,
Landour Convalescent Depot	7,528	,,	..
Lebong	6,000	,,	..
Lucknow Kalubir's	383	,,	B. M.
Meerut	737	,,	S. B. M.
Muttra	560	,,	,,
Port Blair (Tindal Obsy.)	9	,,	B. M.
Ranikhet	5,980	,,	..
Roorkee	879	,,	S. B. M.
Southern Command.			
Ahmedabad	162	,,	,,
Ahmednagar	2,180	,,	Map.
Bangalore	3,002	,,	S. B. M.
Belgaum	2,523	,,	,,
Colaba (Bombay Town Hall)	20	,,	,,
Deolali	1,894	,,	,,
Jubbulpore	1,320	,,	,,
Kamptee (Railway Station)	940	,,	B. M.
Madras (Obsy.)	250	,,	,,
Malapuram (Railway Station)	1,380	,,	,,
Mhow	1,887	,,	,,
Mount Abu Sanatorium	3,836	,,	,,
Nasirabad	1,461	,,	Map.
Pachmarhi	3,490	,,	,,
Poona	1,867	,,	S. B. M.
Saugor	1,755	,,	,,
Secunderabad	1,776	,,	,,
Wellington (Stn. Hospital)	5,800	,,	Map.

S. D. = Survey Department.

S. B. M. = Standard Bench Mark.

B. M. = G. T. Bench Mark.

S. G. = Surveyor-General of India.

M. D. = Meteorological Department.

V. G. L. = Village Ground level.

Map = Heights taken from Topo. Maps.

I. B. = Intelligence Branch of the Division of the Chief of the Staff.

TABLE I

BRITISH OTHER RANKS.

INDIA.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick, during the year 1938.

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.				
Common cold	11·8	..	...	0·24
Diphtheria	1·2	0·02	..	0·14
Dysentery	26·8	0·05	0·07	1·26
Enteric fevers (inclusive of typhoid, para A, B and C and enteric group)	0·9	0·12	0·02	0·13
Erysipelas	0·05	..	..	0·00
Influenza	13·2	..	..	0·37
Malaria	50·4	0·07	..	2·15
Measles	0·4	..	..	0·03
Meningococcal infection	0·05	0·02	..	0·00
Mumps	0·4	..	..	0·02
Pneumonia	3·3	0·30	0·05	0·30
Pyrexia of uncertain origin	0·2	..	..	0·02
Rheumatic fever	1·2	..	0·21	0·15
Sandfly fever	24·8	..	..	0·47
Scarlet fever	0·1	..	..	0·01
Smallpox	0·1	..	..	0·01
Tuberculosis — Pulmonary	1·2	0·05	1·18	0·31
Tuberculosis — Other	0·0	0·05	0·19	0·01
Venereal diseases — Gonorrhœa	28·0	..	0·02	3·11
Venereal diseases — Soft chancre	7·9	..	..	0·73
Venereal diseases — Syphilis	7·6	..	0·05	0·67
Venereal diseases — Other V. D.	1·5	..	0·02	0·08
Other diseases due to infection	12·5	0·21	0·09	0·59
Diseases due to infestation by metazoan parasites — Scabies	1·9	..	..	0·06
Diseases due to infestation by metazoan parasites — Other diseases	3·7	..	0·05	0·19
OTHER DISEASES CLASSIFIED UNDER SYSTEM.				
Diseases of the nervous system	9·2	0·19	0·63	0·43
Mental diseases	2·5	0·02	1·51	0·58

TABLE I—*contd.*

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
OTHER DISEASES CLASSIFIED UNDER SYSTEM—*contd.*				
Diseases of the :—				
Eye	3·4	..	0·28	0·17
Ear and nose	24·8	0·02	0·12	0·73
Circulatory system. — Valvular diseases of the heart.	0·1	..	0·14	0·01
Circulatory system. — Disordered action of the heart.	2·0	0·02	0·26	0·14
Circulatory system. — Other diseases	2·0	0·07	0·19	0·19
Blood and blood forming organs	5·8	..	0·16	0·35
Ductless or endocrine glands	0·2	..	0·09	0·03
Breast	0·3	..	..	0·02
Respiratory system. — Larynx and trachea	1·3	..	..	0·04
Respiratory system. — Bronchi and bronchioles	18·2	..	0·28	0·71
Respiratory system. — Other diseases	1·9	0·05	0·23	0·18
Teeth and gums	2·8	..	0·02	0·08
Digestive system. — Inflammation of tonsils	33·7	..	..	0·78
Digestive system. — Inflammation of pharynx	10·3	..	..	0·21
Digestive system. — Inflammation of stomach	7·6	..	0·05	0·29
Digestive system. — Gastric ulcer	0·8	0·02	0·19	0·15
Digestive system. — Duodenal ulcer	0·4	0·02	0·09	0·07
Digestive system. — Liver	1·9	0·02	0·02	0·15
Digestive system. — Other diseases	58·9	0·21	0·39	2·21
Diseases due to disorders of nutrition or of metabolism	0·3	..	0·07	0·03
Diseases of the :—				
Generative system	14·2	..	..	0·66
Bones, joints, muscles, fasciæ and bursæ	26·4	0·02	0·97	1·42
Areolar tissue	53·6	0·05	0·02	1·75
Skin	43·4	..	0·30	1·85
Urinary system	5·8	0·02	0·26	0·38
Injuries — General	3·4	0·49	0·05	0·10
Injuries — Local	62·4	0·46	0·79	2·63
Injuries — In action	0·3	0·12	0·19	0·03
Tumours and cysts	2·9	0·05	0·12	0·14
Poisons	0·3	0·05	..	0·01
No appreciable disease	3·5	..	..	0·14
*Suicides	0·0	0·07	..	0·00
Total	603·7	2·78	9·35	27·61

*The figures against "Suicides" having already been shown under the heading of the injury, etc., which caused death, are not included in the total.

TABLE II

BRITISH OTHER RANKS—*contd.*

NORTHERN COMMAND.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick, during the year 1938.

Diseases.	Admissions.	Deaths.	Constantly sick.
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.			
Common cold	8·1	..	0·16
Diphtheria	1·2	0·07	0·15
Dysentery	21·1	0·07	0·98
Enteric fevers (inclusive of typhoid, para. A, B and C and enteric group)	1·5	0·21	0·21
Erysipelas	0·1	..	0·00
Influenza	10·0	..	0·30
Malaria	56·0	0·07	1·99
Measles	0·6	..	0·07
Meningococcal infection	0·1	..	0·01
Mumps	0·4	..	0·02
Pneumonia	3·3	0·21	0·33
Pyrexia of uncertain origin	0·3	..	0·02
Rheumatic fever	0·8	..	0·06
Sandfly fever	46·6	..	0·79
Scarlet fever	0·1	..	0·01
Smallpox	0·1	..	0·01
Tuberculosis — Pulmonary	1·2	.	0·26
Tuberculosis — Other	..	..	..
Venereal diseases — Gonorrhœa	24·2	..	2·58
Venereal diseases — Soft chancre	6·0	..	0·58
Venereal diseases — Syphilis	4·1	..	0.37
Venereal diseases — Other V. D.	1.4	..	0·06
Other diseases due to infection	7·8	0·35	0·46
Diseases due to infestation by metazoan parasites. — Scabies	2·6	..	0·06
Diseases due to infestation by metazoan parasites. — Other diseases	2·6	..	0·07
OTHER DISEASES CLASSIFIED UNDER SYSTEM.			
Diseases of the nervous system	10·2	0.21·	0·46
Mental diseases	1·7	..	0·31
Diseases of the eye	3·4	..	0·17
Diseases of the ear and nose	31·9	0·07	0·87
Diseases of the circulatory system. — Valvular disease of the heart	0·3	..	0·02
Diseases of the circulatory system. — Disordered action of the heart	2·0	0·07	0·12
Diseases of the circulatory system. — Other diseases	2·7	0·07	0·21

TABLE II—*contd.*

Diseases.		Admissions.	Deaths.	Constantly sick.
OTHER DISEASES CLASSIFIED UNDER SYSTEM—*contd.*				
Diseases of the blood and blood forming organs		3·5	..	0·20
Diseases of ductless or endocrine glands		0·2	..	0·01
Diseases of the breast		0·2	..	0 03
Diseases of the respiratory system.	Larynx and trachea	1·2	..	0·03
	Bronchi and bronchioles	21·5	..	0·80
	Other diseases	1·9	..	0·13
Diseases of the teeth and gums		2·5	..	0·04
Diseases of the digestive system.	Inflammation of tonsils	38·0	..	0·84
	Inflammation of pharynx	10·7	..	0·19
	Inflammation of stomach	8·7	..	0·29
	Gastric ulcer	0·6	..	0·10
	Duodenal ulcer	0·4	..	0·06
	Liver	0·6	..	0·07
	Other diseases	58·8	..	2·05
Diseases due to disorders of nutrition or of metabolism		0·1	..	0·02
Diseases of the generative system		14·6	..	0·63
Diseases of bones, joints, muscles, fasciæ and bursæ		36·1	..	1·82
Diseases of the areolar tissue		51·2	0·14	1·54
Diseases of the skin		32·8	..	1·28
Diseases of the urinary system		5·3	..	0·30
Injuries	General	5·9	0·62	0·16
	Local	64·2	0·76	2·49
	In action	0·8	0·35	0·10
Tumours and cysts		3·5	0·07	0·19
Poisons		0·3	..	0·00
No appreciable disease		2·9	..	0·12
*Suicides		..	0·07	..
	Total	618·8	3·47	25·22

* The figures against "Suicides" having already been shown under the heading of the injury, etc., which caused death, are not included in the total.

TABLE III

BRITISH OTHER RANKS—*contd.*

WESTERN COMMAND.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick, during the year 1938.

Diseases.	Admissions.	Deaths.	Constantly sick.
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.			
Common cold	21·8	..	0·42
Diphtheria	3·1	..	0·51
Dysentery	42·5	..	1·71
Enteric fevers (inclusive of typhoid, para. A, B and C and enteric group)	..	..	..
Erysipelas	..	..	..
Influenza	0·6	..	0·01
Malaria	59·2	0·28	1·79
Measles	..	..	..
Meningococcal infection	..	..	..
Mumps	..	..	0·01
Pneumonia	1·1	0·28	0·04
Pyrexia of uncertain origin	..	..	..
Rheumatic fever	1·1	..	0·25
Sandfly fever	50·2	..	1·02
Scarlet fever	..	..	..
Smallpox	..	..	..
Tuberculosis — Pulmonary	1·1	0·28	0·46
Tuberculosis — Other	..	0·28	0·03
Venereal diseases — Gonorrhœa	26·9	..	3·66
Venereal diseases — Soft chancre	21·3	..	1·74
Venereal diseases — Syphilis	11·6	..	1·02
Venereal diseases — Other V. D.	3·1	..	0·25
Other diseases due to infection	11·1	..	0·42
Diseases due to infestation by metazoan parasites — Scabies	3·1	..	0·14
Diseases due to infestation by metazoan parasites — Other diseases	4·0	..	0·12
OTHER DISEASES CLASSIFIED UNDER SYSTEM.			
Diseases of the nervous system	9·1	0·28	0·47
Mental diseases	2·0	..	0·54
Diseases of the :—			
Eye	3·1	..	0·18
Ear and nose	20·1	..	0·59
Diseases of the circulatory system — Valvular diseases of the heart	0·3	..	0·01
Diseases of the circulatory system — Disordered action of the heart	1·4	..	0·09
Diseases of the circulatory system — Other diseases	2·6	0·28	0·13

TABLE III—*contd.*

Diseases.	Admissions.	Deaths.	Constantly sick.
OTHER DISEASES CLASSIFIED UNDER SYSTEM—*contd.*			
Diseases of the :—			
Blood and blood forming organs	4·5	..	0·26
Ductless or endocrine glands	0 3	..	0·01
Breast	0·3	..	0·00
Respiratory system — Larynx and trachea	0·3	..	0·03
Respiratory system — Bronchi and bronchioles	22·1	..	0·85
Respiratory system — Other diseases	2·3	0·28	0·26
Teeth and gums	4·3	..	0·09
Digestive system — Inflammation of tonsils	28·9	..	0·75
Digestive system — Inflammation of pharynx	4·5	..	0·10
Digestive system — Inflammation of stomach	9·9	..	0·51
Digestive system — Gastric ulcer	2·3	..	0·53
Digestive system — Duodenal ulcer	..	..	0.01
Digestive system — Liver	0·6	..	0·06
Digestive system — Other diseases	64·1	..	2·31
Diseases due to disorders of nutrition or of metabolism	0·3	..	0·14
Diseases of the :—			
Generative system	15·6	..	0·67
Bones, joints, muscles, fasciæ and bursæ	22·1	..	0·96
Areolar tissue	37·1	..	1·26
Skin	38·8	..	2·25
Urinary system	5·7	..	0·37
Injuries — General	4·3	1·13	0·05
Injuries — Local	51·6	0·28	2·14
Injuries — In action	..	..	..
Tumours and cysts	3·1	..	0·12
Poisons	0·3	..	0·00
No appreciable disease	2·6	..	0·07
*Suicides	0·3	0·28	0·00
Total	626·1	3·40	29·41

* The figures against "Suicides" having already been shown under the heading of the injury, etc., which caused death, are not included in the total.

TABLE IV

BRITISH OTHER RANKS—*contd.*

EASTERN COMMAND.

Table showing ratios per 1,000 of the strength of admissions into hospital deaths and constantly sick, during the year 1938.

Diseases.	Admissions.	Deaths.	Constantly sick.
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.			
Common cold	11·4	.	0·24
Diphtheria	0·7	..	0·08
Dysentery	29·8	0·08	1·57
Enteric fevers (inclusive of typhoid, para. A, B and C and enteric group)	0·5	0·08	0·09
Erysipelas	..	..	..
Influenza	18·0	..	0·45
Malaria	33·0	..	1·71
Measles	0·2	..	0·01
Meningococcal infection	0·1	0·08	0·00
Mumps	0·6	..	0·03
Pneumonia	4·4	0·45	0·35
Pyrexia of uncertain origin	0·2	..	0·02
Rheumatic fever	1·2	..	0·15
Sandfly fever	12·1	..	0·28
Scarlet fever	0·1	..	0·01
Small-pox	0·2	..	0·01
Tuberculosis — Pulmonary	0·8	..	0·19
Tuberculosis — Other	..	..	..
Venereal diseases — Gonorrhœa	28·9	..	3·39
Venereal diseases — Soft chancre	4·6	..	0·54
Venereal diseases — Syphilis	8·9	..	0·78
Venereal diseases — Other V. D.	1·5	..	0·09
Other diseases due to infection	16·8	..	0·77
Diseases due to infestation by metazoan parasites — Scabies	1·1	..	0·04
Diseases due to infestation by metazoan parasites — Other diseases	3·7	..	0·12
OTHER DISEASES CLASSIFIED UNDER SYSTEM.			
Diseases of the nervous system	10·5	0·15	0·44
Mental diseases	3·2	..	0·55
Diseases of the eye	3·9	..	0·21
Diseases of the ear and nose	24·9	..	0·79
Diseases of the circulatory system — Valvular diseases of the heart	.	..	0·01
Diseases of the circulatory system — Disordered action of the heart	2·4	..	0·13
Diseases of the circulatory system — Other diseases	1·7	0·08	0·19

TABLE IV—*contd.*

Diseases.		Admissions.	Deaths.	Constantly sick.
OTHER DISEASES CLASSIFIED UNDER SYSTEM—*contd.*				
Diseases of the blood and blood forming organs		6·1	..	0·36
Diseases of ductless or endocrine glands		0·3	..	0·08
Diseases of the breast		0·5	..	0·02
Diseases of the respiratory system.	Larynx and trachea	2·0	..	0·04
	Bronchi and bronchioles	17·2	..	0·69
	Other diseases.	2·3	0·08	0·22
Diseases of the teeth and gums		2·3	..	0·08
Diseases of the digestive system.	Inflammation of tonsils	27·7	..	0·69
	Inflammation of pharynx	10·5	..	0·23
	Inflammation of stomach	6·2	..	0·21
	Gastric ulcer	0·7	..	0·10
	Duodenal ulcer	0·7	..	0·11
	Liver	4·0	..	0·34
	Other diseases	61·2	0·38	2·46
Diseases due to disorders of nutrition or of metabolism		0·4	..	0·03
Diseases of the generative system		9·4	..	0·55
Diseases of bones, joints, muscles, fasciæ and bursæ		20·4	..	1·19
Diseases of the areolar tissue		55·9	..	1·82
Diseases of the skin		59·7	..	2·51
Diseases of the urinary system		6·4	..	0·40
Injuries	General	1·8	0·30	0·10
	Local	63·6	0·30	2·90
	In action	..	..	..
Tumours and cysts		3·3	0·08	0·19
Poisons		0·2	0·15	0·01
No appreciable disease		3·1	..	0·12
*Suicides		..	..	..
	Total	591·4	2·20	28·72

* The figures against "Suicides" having already been shown under the heading of the injury, etc., which caused death, are not included in the total.

TABLE V

BRITISH OTHER RANKS—*contd.*

SOUTHERN COMMAND.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick, during the year 1938.

Diseases.		Admissions.	Deaths.	Constantly sick.
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.				
Common cold		13·8	..	0·26
Diphtheria		1·3	..	0·10
Dysentery		25·6	..	1·13
Enteric fevers (inclusive of typhoid, para. A, B and C and enteric group).		0·8	0·08	0·12
Erysipelas		0·1	..	0·00
Influenza		15·5	..	0·46
Malaria		60·0	0·08	2·92
Measles		0·3	..	0·02
Meningococcal infection		..	..	..
Mumps		0·3	..	0·02
Pneumonia		2·8	0·25	0·28
Pyrexia of uncertain origin		0·2	..	0·01
Rheumatic fever		1·8	..	0·22
Sandfly fever		5·0	..	0·12
Scarlet fever		0·3	..	0·02
Smallpox		0·1	..	0·01
Tuberculosis	Pulmonary	1·5	0·08	0·44
	Other	0·1	0·08	0·02
Venereal diseases	Gonorrhœa	32·0	..	3·29
	Soft chancre	9·8	..	0·82
	Syphilis	9·3	..	0·80
	Other V. D.	1·3	..	0·05
Other diseases due to infection		13·8	0·33	0·58
Diseases due to infestation by metazoan parasites.	Scabies	1·7	..	0·04
	Other diseases	5·1	..	0·11
OTHER DISEASES CLASSIFIED UNDER SYSTEM.				
Diseases of the nervous system		6·5	0·17	0·36
Mental diseases		2·9	0·08	0·95
Diseases of the eye		2·9	..	0·13
Diseases of the ear and nose		17·5	..	0·55
Diseases of the circulatory system.	Valvular diseases of the heart	..	..	0·01
	Disordered action of the heart	1·3	..	0·15
	Other diseases	1·5	..	0·19

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TABLE V—*contd.*

Diseases.		Admissions.	Deaths.	Constantly sick.
OTHER DISEASES CLASSIFIED UNDER SYSTEM—*contd.*				
Diseases of the blood and blood forming organs		8·7	..	0·56
Diseases of ductless or endocrine glands		0·2	..	0·01
Diseases of the breast		0·1	..	0·00
Diseases of the respiratory system.	Larynx and trachea	0·8	..	0·03
	Bronchi and bronchioles	14·3	..	0·59
	Other diseases	1·2	..	0·16
Diseases of the teeth and gums		3·3	..	0·12
Diseases of the digestive system.	Inflammation of tonsils	36·5	..	0·82
	Inflammation of pharynx	11·3	..	0·25
	Inflammation of stomach	6·9	..	0·30
	Gastric ulcer	0·8	0·08	0·14
	Duodenal ulcer	0·2	..	0·04
	Liver diseases	1·3	..	0·08
	Other diseases	55·0	0·33	2·09
Diseases due to disorders of nutrition or of metabolism		0·4	..	0·01
Diseases of the generative system		18·7	..	0·83
Diseases of bones, joints, muscles, fasciæ and bursæ		22·6	0·08	1·32
Diseases of the areolar tissue		58·9	..	2·08
Diseases of the skin		39·6	..	1·69
Diseases of the urinary system		5·7	0·08	0·45
Injuries	General	1·8	0·25	0·03
	Local	62·1	0·42	2·65
	In action	..	..	..
Tumours and cysts		2·9	..	0·13
Poisons		0·3	..	0·02
No appreciable disease		3·8	..	0·13
*Suicides		..	0·08	..
	Total	592·3	2·42	28·78

*The figures against "Suicides" having already been shown under the heading of the injury, etc., which caused death, are not included in the total.

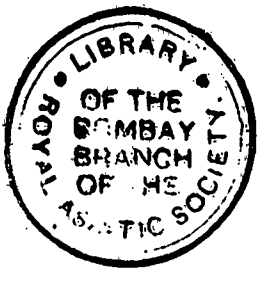
TABLE VI.

BRITISH OTHER RANKS.

Table showing monthly ratios per 1,000 of the strength of admissions for certain diseases for all-India during the year 1938.

Months.	Enteric group of fevers.	Influenza.	Cholera.	Small pox.	Malaria.	Dysentery protozoal.	Dysentery bacillary.	Dysentery bacillary exudate.	Dysentery group.	Pyrexia of uncertain origin.	Pneumonia (lobar and lobular).	Diarrhœa.	Dengue.	Sandfly fever.	Plague.	Effects of heat.	All Causes.
January	0·1	1·2	..	0·0	1·5	0·2	0·3	0·2	0·2	..	0·4	0·9	0·2	0·1	..	..	44·7
February	0·1	1·3	..	..	1·1	0·2	0·4	0·3	0·3	..	0·2	0·7	0·1	0·1	..	0·0	35·7
March	0·1	1·9	..	..	1·7	0·2	1·1	0·3	0·4	0·0	0·3	1·8	0·1	0·6	..	0·0	44·4
April	..	1·3	..	..	2·9	0·4	2·2	0·8	0·6	0·0	0·2	2·4	0·1	1·9	..	0·0	49·7
May	0·0	0·7	0·0	..	8·5	0·2	1·1	0·6	0·3	0·0	0·3	2·4	0·1	3·7	..	0·2	53·2
June	0·2	1·1	..	..	4·4	0·3	1·5	0·6	0·4	0·0	0·2	1·9	0·1	4·8	..	0·3	56·4
July	0·1	1·3	..	..	4·8	0·5	2·2	0·7	0·5	0·0	0·3	2·5	0·2	4·2	..	0·5	63·4
August	0·0	0·9	..	..	6·6	0·3	1·6	0·2	0·9	0·0	0·1	2·0	0·0	3·8	..	0·5	59·6
September	0·0	0·9	..	..	7·1	0·1	0·7	0·3	0·3	0·0	0·1	0·8	0·4	2·9	..	0·1	51·7
October	0·1	0·9	..	..	7·4	0·2	0·9	0·3	0·3	0·0	0·2	0·9	0·7	2·3	..	..	55·3
November	0·0	0·5	..	..	7·9	0·2	1·3	0·4	0·3	..	0·4	0·8	1·4	0·4	..	0·0	50·0
December	0·0	0·9	..	0·0	2·3	0·3	0·4	0·1	0·2	..	0·4	0·8	0·6	0·0	..	..	41·9
Total	0·8	13·2	0·0	0·1	50·4	3·2	13·7	4·9	5·0	0·2	3·0	18·0	3·8	25·1	..	1·7	605·0

TABLE VII.



TABLE

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Table showing ratios per 1,000 of strength of admissions for certain

Stations and districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para A.	Para B.	Para C.	Enteric group.	Bacillary.	Bacillary exudate.	Protozoal.	Clinical.
Cherat	..	..	2·9	..	..	..	..	..	..
Landikotal	..	..	..	..	..	9·0	..	..	1·5
Nowshera	1·1	..	..	..	..	7·5	5·4	1·1	3·2
Peshawar	0·8	..	..	..	..	12·7	..	..	6·8
Risalpur	..	..	..	..	..	2·9	..	..	2·9
Total Peshawar District	0·5	..	0·3	..	..	7·8	1·3	0·3	3·7
Kohat	..	..	..	..	..	17·9	8·9	..	..
Total Kohat District	..	..	..	..	..	16·1	8·1	..	..
Abbottabad	..	..	..	..	..	28·0	9·3	..	..
Barian	..	..	..	..	..	..	..	..	..
Campbellpore	..	..	8·8	..	..	8·8	..	..	..
Gharial	..	..	..	..	..	5·9	3·0	..	..
Jhelum	..	..	..	..	..	..	..	..	142·9
Khanspur	6·1	..	..	..	..	3·1	12·3	6·1	..
Kuldana	..	..	..	..	..	3·9	..	..	..
Kalabagh Hazara	..	..	..	..	16·1	..	16·9	..	33·9
Murree	..	..	..	..	..	11·2	..	..	..
Rawalpindi	..	..	..	..	..	5·9	1·0	2·0	5·4
Total Rawalpindi District	0·3	..	0·3	..	0·3	6·3	2·1	1·5	4·2
Ambala	3·3	1·7	..	..	..	23·1	..	..	6·6
Amritsar	..	..	..	..	..	..	..	..	..
Dagshai	..	..	..	..	3·4	13·5	3·4	..	..
Dalhousie	..	..	..	..	..	9·8	..	..	..
Kasauli	3·2	..	..	..	..	22·3	..	3·2	..
Ferozepore	1·4	..	..	..	1·4	1·4	4·3	..	2·5
Jullundur	..	..	..	..	1·7	3·5	6·0	..	6·9
Jutogh	7·4	..	..	..	..	14·8	7·4	..	..
Lahore	2·1	..	..	..	..	12·6	4·2	3·2	6·3
Multan	..	..	..	..	2·3	6·3	6·3	..	18·1
Sialkot	1·0	..	..	..	..	16·3	7·9	3·9	1·0
Solon	..	..	..	..	..	16·0	..	16·0	..
Subathu	..	..	..	..	..	..	..	..	..
Total Lahore District	1·4	0·2	..	..	0·7	11·7	4·1	1·7	5·0

VII.

OTHER RANKS.

diseases in each station and district in India during the year 1938.

Diarrhœa.	Cholera.	Venereal diseases.	Smallpox.	Malaria.	Dengue.	Sandfly fever.	Plague.	Influenza.	Pneumonia (lobar and lobular).	Heat stroke.	Heat exhaustion.	All Causes.	Constantly sick.
23·0	..	23·0	..	14·4	..	28·7	..	..	2·9	..	..	425·3	14·91
13·5	..	31·5	..	43·5	..	239·9	..	7·5	6·0	..	..	890·6	24·65
5·4	..	35·5	..	68·8	..	63·4	..	30·1	7·5	2·2	2·2	643·0	27·16
19·5	..	14·4	0·8	40·7	..	129·7	..	8·5	3·4	1·7	11·9	622·0	28·36
30·0	..	18·6	..	71·4	..	62·9	..	4·3	1·4	1·4	2·9	574·3	8·33
17·3	..	24 1	0·3	51·2	..	111·4	..	12·0	4·4	1·3	4·7	647·3	22·72
62·5	..	8·9	..	53 6	..	71·4	..	26·8	8·9	..	..	776·8	24·29
56·5	..	8·1	..	48·4	..	64·5	..	24·2	8·1	..	..	701·6	21·94
..	..	74·8	..	186·9	..	..	..	..	..	..	..	439·3	11·68
..	..	136·9	..	59·5	..	11·9	..	..	..	..	..	470·2	59·46
44·2	..	8·8	..	26·5	..	35·4	..	8·8	..	..	..	557·5	15·84
..	..	8·9	..	8·9	..	3·0	..	..	..	..	..	421·4	7·60
..	..	..	..	..	..	..	..	..	..	..	..	428·6	4·29
6·1	..	6·1	..	24·5	..	..	..	6·1	..	..	..	276·1	8·53
..	..	11·8	..	141·7	..	..	..	..	..	..	..	507·9	4·84
33·9	..	50·8	..	33·9	..	50·8	..	..	..	..	..	491·5	54·07
22 5	..	..	..	123·6	..	11·2	..	11·2	11·2	..	..	2202·2	211·91
19·2	..	42 3	..	102·9	..	65·9	..	18·2	1·5	0·5	0·5	617·1	25·70
14·7	..	38 4	..	95·5	..	43·6	..	12·0	1·2	0·3	0·3	596·3	27·79
16·5	..	39·6	..	13·2	..	11·5	..	1·7	..	..	..	595·8	27·62
12·6	..	62·9	..	12·6	..	..	..	12·6	..	..	94·3	748·4	25·47
3·4	..	28·6	..	16·9	..	..	..	..	3·4	..	..	324·3	12·84
14·6	..	26·8	..	12·2	..	..	..	24·4	..	..	..	456·1	31·90
22·3	..	6·4	..	25·5	..	..	..	..	..	..	..	480·9	22·01
8·5	..	72·6	..	55·6	..	10·0	..	7·1	4·3	..	2·8	564·1	25·24
27·8	..	41·7	..	8·7	..	1·7	..	12·2	..	..	..	633·7	21·13
14·8	..	44·4	..	14·8	..	..	..	7·4	..	..	..	451·9	16·74
18·9	..	51·6	..	22·1	..	4·2	..	29·5	2·1	..	4·2	708·4	33·87
9·0	..	70·0	..	22·6	..	2·3	..	..	4·5	..	2·3	580·1	22·12
10·9	..	33·6	..	3·9	..	29·6	..	..	5·9	..	..	566·6	22·25
24·0	..	16·0	..	40·0	..	..	..	..	8·0	..	..	448·0	15·68
..	..	..	..	..	..	..	..	..	..	..	..	..	3·39
14·9	..	43·3	..	19·7	..	8·6	..	9·3	2·6	..	3·8	568·1	24·77

TABLE

Stations and districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para A.	Para B.	Para C.	Enteric group.	Bacillary.	Bacillary exudate.	Protozoal.	Clinical.
Bannu	..	..	..	..	..	17·4	..	8·7	8·7
Dera Ismail Khan	..	..	..	..	..	..	..	..	20·4
Kala bagh & Mari Indus	..	..	..	..	..	..	..	..	..
Mir Ali	..	..	..	..	6·4	6·4	..	..	..
Manzai	..	..	..	..	..	..	..	..	..
Razmak	..	..	..	..	1·1	48·7	11·3	3·4	19·2
Wana	..	..	..	..	..	..	13·0	..	13·0
Total Waziristan District	..	..	..	..	1·5	34·5	8·2	3·0	15·0
Quetta	..	..	..	..	..	21·2	1·6	3·3	11·4
Total Baluchistan District	..	..	..	..	..	21·2	1·6	3·3	11·4
Hyderabad	..	..	..	..	..	18·5	6·7	..	15·1
Karachi	..	..	..	..	..	15·8	8·8	1·2	21·1
Total Sind Bde. Area	..	..	..	..	..	16·5	8·3	0·9	19·6
Bareilly	..	..	..	..	..	31·3	..	1·4	2·8
Chakrata	..	..	..	..	..	5·6	8·4	..	1·4
Dehra Dun	..	..	..	..	..	5·0	5·0	5·0	..
Jhansi	..	..	..	..	..	35·2	5·0	7·0	3·0
Landour	..	..	..	..	..	50·0	..	..	..
Meerut	0·6	..	..	..	..	24·6	7·8	0·6	..
Roorkee	..	..	..	..	..	..	..	..	..
Total Meerut District	0·2	..	..	..	..	23·9	5·7	2·4	1·4
Allahabad	..	..	..	..	..	12·9	1·4	4·3	2·9
Benares	..	..	..	..	..	..	..	15·0	..
Cawnpore	..	..	..	..	..	1·4	..	2·9	15·9
Fyzabad	..	..	..	..	..	3·6	1·8	1·8	9·1
Lucknow	..	..	..	..	0·6	19·7	1·8	16·8	6·6
Ranikhet	2·0	..	..	..	..	20·8	2·0	8·9	1·0
Total Lucknow District	0·4	..	..	..	0·2	13·9	1·5	9·5	6·3
Calcutta (Alipore)	..	1·3	..	..	..	22·7	8·0	4·0	1·3
Barrackpore	..	..	..	..	2·4	12·0	4·8	7·2	..
Port Blair	..	..	..	..	..	..	..	16·4	..
Dacca	..	..	..	..	..	..	..	..	..
Dinapore	..	..	..	..	..	8·0	2·0	2·0	4·0
Lebong	..	..	..	..	..	7·2	..	..	2·4
Total P. & A. District	..	0·5	..	..	0·5	13·1	4·1	4·1	1·8
Agra	..	..	..	..	..	10·4	7·4	..	3·0
Delhi	..	..	..	..	..	11·0	8·0	4·0	8·0
Muttra	..	..	..	..	..	9·7	6·5	3·2	3·2
Total Delhi Bde. Area	..	..	..	..	..	10·5	7·5	2·5	5·5
Ahmednagar	..	..	1·1	..	2·2	10·1	10·1	2·2	..
Jubbulpore	..	..	..	..	..	13·4	6·3	3·1	..
Kamptee	..	..	..	..	..	9·3	4·6	2·3	2·3

VII—*contd.*

Diarrhœa.	Cholera.	Venereal diseases	Smallpox.	Malaria.	Dengue.	Sandfly fever	Plague.	Influenza.	Pneumonia (lobar and lobular).	Heat stroke.	Heat exhaustion	All Causes.	Constantly sick.
43·5	..	8·7	..	304·3	..	121·7	..	8·7	8·7	..	..	582·6	29·91
40·8	..	..	..	122·4	..	122·4	..	..	..	..	..	551·0	14·29
..	..	..	..	500·0	..	..	..	..	..	..	..	500·0	7·50
70·1	..	6·4	..	59·2	...	95·5	..	..	..	..	6·4	993·6	16·88
..	..	20·4	..	81·6	..	20·4	..	..	..	..	..	551·0	17·76
40·8	..	20·4	..	106·5	..	11·3	..	..	5·7	..	1·1	800·7	32·79
13·0	..	..	..	142·9	..	..	..	..	13·0	..	..	545·5	15·45
41·2	..	15·7	..	132·7	..	34·5	..	0·7	5·2	..	1·5	805·1	28·36
32·6	..	52·1	..	65·1	..	114·8	..	1·6	0·8	..	3·3	688·9	27·80
32·6	..	52·1	..	65·1	..	114·8	..	1·6	0·8	..	3·3	688·9	27·80
11·8	..	67·2	..	97·5	..	20·2	..	..	..	3·4	..	670·6	15·75
22·9	..	62·2	..	42·2	2·9	14·7	..	..	1·2	0·6	..	568·9	34·79
20·0	..	63·5	..	56·5	2·2	16·1	..	..	0·9	1·3	..	595·2	29·87
8·5	..	25·6	1·4	9·9	..	31·3	..	..	4·3	1·4	1·4	669·0	28·68
..	..	20·9	..	58·6	..	..	..	11·2	7·0	..	..	394·7	18·43
9·9	..	99·0	..	14·9	..	..	..	29·7	19·8	..	..	762·4	32·82
14·1	..	16·1	..	56·3	2·0	37·2	..	6·0	4·0	..	1·0	668·3	25·58
50·0	..	..	..	..	..	..	..	..	..	..	..	300·0	11·00
44·7	..	27·8	0·6	41·5	2·6	2·6	..	44·7	0·6	0·6	0·6	592·0	33 97
..	..	..	..	..	..	..	..	..	25·6	..	..	205·1	5·13
25·1	..	26·5	0·5	40·7	1·4	14·9	..	21·1	4·8	0·5	0·7	592·5	27·97
45·9	..	24·4	..	11·5	..	10·0	..	10·0	1·4	1·4	..	525·1	20·47
30·1	..	157·9	..	45·1	..	112·8	..	..	..	..	..	1082·7	52·56
15·9	..	53·5	1·4	10·1	1·4	44·8	..	27·5	1·4	..	..	497·1	21·05
14·5	..	32·7	..	16·4	..	45·5	..	1·8	1·8	..	..	494·5	17·69
16·2	..	54·5	..	4·8	..	1·2	..	18·6	4·2	1·8	..	627·8	34·83
21·7	1·0	19·8	..	10·9	..	..	..	29·6	4·0	..	..	542·5	35·24
21·9	0·2	42·9	0·2	10·3	0·2	16·8	..	18·5	2·9	0·8	..	572·9	29·32
12·0	..	108·0	..	41·3	122·7	1·3	..	24·0	9·3	..	..	825·3	36·72
..	..	89·2	..	28·9	12·0	..	..	4·8	4·8	..	..	414·5	42·41
8·2	..	32·8	..	24·6	..	49·2	..	..	..	..	..	524·6	22·95
..	..	..	..	..	..	..	..	..	..	..	..	111·1	2·22
2·0	..	29·8	..	39·8	..	19·9	..	6·0	4·0	..	..	594·6	18·11
2·4	..	28·8	..	12·0	..	..	..	12·0	4·8	..	..	304·6	9·78
5·4	..	67·2	..	32·0	43·8	7·7	..	12·6	5·9	..	..	574·0	27·59
14·8	..	56·2	..	25·1	..	10·4	..	47·3	1·5	4·4	1·5	656·8	28·39
14·9	..	36·9	..	117·5	1·0	3·0	..	1·0	8·0	..	..	653·4	29·46
16·2	..	61·7	..	22·7	..	..	..	..	3·2	..	..	750·0	32·01
15·0	..	47·0	..	71·0	0·5	5·0	..	16·5	5·0	1·5	0·5	665·2	29·30
4·5	..	42·6	..	50·5	14·6	4·5	..	8·4	..	..	1·1	480·4	9·34
13·4	..	55·9	..	63·0	3·9	..	..	18·9	3·1	..	..	504·7	26·02
32·4	..	18·5	..	115·7	..	37·0	..	25·5	2·3	..	..	754·6	22·52

TABLE

Stations and districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para A.	Para B.	Para C.	Enteric group.	Bacillary.	Bacillary exudate.	Protozoal.	Clinical.
Pachmarhi	...	...	...	...	...	...	19·2	...	...
Sangor	47·6	...	...	...	...	...	...	...	...
Trimulgherry (S'bad.)	...	...	...	...	0·5	17·4	...	3·7	5·5
Total Deccan District	0·2	...	0·2	...	0·6	14·0	4·1	3·1	2·7
Belgaum	...	...	...	...	...	...	...	...	...
Poona	...	...	...	...	2·2	16·4	9·8	1·6	...
Total Poona Bde. Area	...	...	...	...	2·1	15·6	9·4	1·6	...
Ahmedabad	...	...	...	...	...	14·3	64·3	...	...
Bombay (Colaba)	...	...	...	...	...	4·2	4·2	...	...
Deolali	...	...	...	...	...	...	3·3	...	3·3
Mhow	...	...	...	...	...	7·8	9·8	3·9	...
Mount Abu	...	...	...	...	...	13·2	39·5	13·2	39·5
Nasirabad	...	...	...	...	...	6·1	1·5	3·1	15·4
Total Bombay District	...	...	...	...	...	6·2	9·3	2·4	4·8
Bangalore	...	...	...	...	...	13·1	9·8	18·6	...
Madras (St. Thomas Mt.)	...	...	...	...	...	3·3	13·1	3·3	...
Malapuram	...	...	...	...	...	...	...	...	...
Wellington	...	...	...	...	...	20·2	7·8	...	1·6
Total Madras District.	...	...	...	...	...	11·8	9·6	8·8	0·4
TOTAL ALL-INDIA	0·3	0·0	0·1	...	0·4	13·7	4·7	3·4	1·9

VII—*concld.*

Diarrhœa.	Cholera.	Venereal diseases.	Smallpox.	Malaria.	Dengue.	Sandfly fever.	Plague.	Influenza.	Pneumonia (lobar and lobular.)	Heat stroke.	Heat exhaustion.	All Causes.	Constantly sick.
...	...	...	...	115·4	...	...	...	...	...	...	...	230·8	6·35
...	...	...	...	...	...	...	...	...	...	...	...	285·7	3·81
20·6	...	75·5	...	44·8	...	7·3	...	10·5	3·7	...	0·5	612 1	32·56
16·5	...	58·1	...	57·5	3·7	7·4	...	12·6	2·7	...	0·4	567·0	25·29
11·8	...	35·3	...	23·5	...	...	...	...	...	...	...	270 6	6·94
14·2	...	41·5	...	72·0	...	...	...	22·9	1·6	...	...	679·2	41·74
14·1	...	41·2	...	09·9	...	...	...	21·9	1·6	...	...	661·1	40·20
...	...	28·6	...	150·0	...	64·3	...	21·4	...	...	...	95 ·0	28·14
15·4	...	95·1	...	53·1	16·8	...	...	83·9	9·8	...	...	793·0	41·06
8·3	...	56·3	...	66·2	...	...	...	3·3	...	...	...	652 3	15·70
7·8	...	23·4	1·0	154·1	8·8	3·9	...	..	1·0	...	...	644·9	30·14
92·1	..	...	...	78·9	...	...	...	...	...	...	...	381·6	11 32
27·6	..	29·2	...	58·4	...	12·3	...	6·1	1·5	...	...	549 9	16 76
15·5	...	45·4	0·3	96·6	7·2	7·2	...	23·4	3·1	...	...	668·6	27·74
5·5	...	35·0	...	10·9	3·3	3·3	...	6·6	1·1	...	1·1	400·4	32·17
14·8	...	90·3	...	4·9	13·1	...	...	14·8	...	...	...	747·1	29·57
9 5	...	152·4	...	47 6	...	...	...	9·5	...	9·5	..	857·1	23·33
12·5	...	24·9	...	7·8	...	...	...	...	4·7	...	...	378·5	18·29
10·0	...	51·9	...	10·0	6·1	1·3	...	7·0	1·7	0·4	0·4	503·3	26·86
18·0	0·0	45·0	0·1	50·4	3·9	24·8	...	13·2	3·8	0·5	1·5	603·7	27·61

TABLE VIII.

BRITISH OFFICERS (BRITISH SERVICE).

INDIA.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick during the year 1938.

Diseases.	Admissions.	Deaths.	Constantly sick.
Specific diseases due to infection or infestation.			
Common cold	7·5	..	0·11
Diphtheria	1·4	..	0·16
Dysentery	32·8	..	1·36
Enteric fever (inclusive of typhoid, paras A, B and C, and enteric group).	2·3	..	0·27
Erysipelas	...	..	..
Influenza	10·8	..	0·23
Malaria	36·6	..	1·24
Measles	...	..	..
Meningococcal infection	...	..	..
Mumps	...	..	0·01
Pneumonia	5·6	1·41	0·26
Pyrexia of uncertain origin	0·9	0·47	0·01
Rheumatic fever	0·9	..	0·03
Sandfly fever	21·6	..	0·37
Scarlet fever.	..	..	..
Smallpox	..	..	..
Tuberculosis — Pulmonary	0·9	..	0·14
Tuberculosis — Other	..	..	..
Venereal diseases — Gonorrhœa	..	..	..
Venereal diseases — Soft chancre	...	..	..
Venereal diseases — Syphilis	..	..	..
Venereal diseases — Other V. D.	..	..	..
Other diseases due to infection	26·3	0·47	0·99
Diseases due to infestation by metazoan parasites. — Scabies	0·5	..	0·00
Diseases due to infestation by metazoan parasites. — Other diseases	3·3	..	0·07
Other diseases classified under systems.			
Diseases of the nervous system	6·1	..	0·22
Mental diseases	1·9	..	0·10
Diseases of the —			
Eye	0·5	..	0·01
Ear and nose	24·9	..	0·56
Diseases of the circulatory system. — Valvular disease of the heart	..	..	..
Diseases of the circulatory system. — Disordered action of the heart	2·3	..	0·09
Diseases of the circulatory system. — Other diseases	0·5	..	0·01
Diseases of the blood and blood forming organs	2·8	..	0·06
Diseases of ductless or endocrine glands	..	..	..
Diseases of the breast	..	..	..
Diseases of the respiratory system. — Larynx and trachea	0·5	..	0·01
Diseases of the respiratory system. — Bronchi and bronchioles	6·1	..	0·17
Diseases of the respiratory system. — Other diseases	0·5	..	0·02
Diseases of the teeth and gums	3·3	..	0·08
Diseases of the digestive system. — Inflammation of tonsils	15·5	..	0·34
Diseases of the digestive system. — Inflammation of pharynx	6·6	..	0·10
Diseases of the digestive system. — Inflammation of stomach	5·2	..	0·13
Diseases of the digestive system. — Gastric ulcer	..	..	..
Diseases of the digestive system. — Duodenal ulcer	1·4	..	0·03
Diseases of the digestive system. — Liver diseases	3·8	..	0·28
Diseases of the digestive system. — Other diseases	68·0	..	1·96
Diseases due to disorders of nutrition or of metabolism	...	..	..
Diseases of the generative system	1·4	..	0·08
Diseases of bones, joints, muscles, fasciæ and bursæ	18·3	..	0·72
Diseases of the areolar tissue	36·1	..	1·02
Diseases of the skin	9·4	..	0·43
Diseases of the urinary system	5·2	0·94	0·25
Injuries — General	4·2	0·47	0·08
Injuries — Local	48·3	1·88	1·69
Injuries — In action	..	..	..
Tumours and cysts	1·9	..	0·12
Poisons	0·5	..	0·00
No appreciable disease	2·3	..	0·03
Suicides	..	..	..
Total	428·9	5·63	13·86

TABLE IX.

WIVES OF WARRANT OFFICERS, N. C. Os. AND MEN.

INDIA.

Table showing ratios per 1,000 of the strength, of admissions into hospital, deaths and constantly sick, during the year 1938.

Diseases.	Admissions.	Deaths.	Constantly sick.
Specific diseases due to infection or infestation.			
Common cold	7·2	...	0·11
Diphtheria	2·0	...	0·16
Dysentery	19·7	...	0·52
Enteric fever (inclusive of typhoid, para A, B and C, and enteric group).	0·8	..	0·10
Erysipelas	0·3	..	0·01
Influenza	4·1	...	0·06
Malaria	20·0	...	0·66
Measles	...	...	...
Meningococcal infection	...	...	...
Mumps	...	...	...
Pneumonia	2·0	0·51	0·09
Pyrexia of uncertain origin	...	...	...
Rheumatic fever	2·0	...	0·10
Sandfly fever	3·8	...	0·08
Scarlet fever	0·3	...	0·03
Smallpox	...	...	0·01
Tuberculosis — Pulmonary	2·0	0·26	0·32
Tuberculosis — Other	0·3	...	0·01
Venereal diseases — Gonorrhœa	...	...	...
Venereal diseases — Soft chancre	...	...	...
Venereal diseases — Syphilis	...	...	...
Venereal diseases — Other V. D.	...	...	...
Other diseases due to infection	3·3	...	0·09
Diseases due to infestation by metazoan parasites — Scabies	...	...	...
Diseases due to infestation by metazoan parasites — Other diseases	2·3	...	0·07
Other diseases classified under systems.			
Diseases of the nervous system	4·9	0·77	0·15
Mental diseases	5·1	...	0·18
Diseases of the eye	1·3	...	0·03
Diseases of the ear and nose	5·9	...	0·18
Diseases of the :—			
Circulatory system — Valvular disease of the heart	1·8	0·26	0·09
Circulatory system — Disordered action of the heart	0·8	...	0·02
Circulatory system — Other diseases	2·6	...	0·21
Blood and blood forming organs	3·8	...	0·14
Ductless or endocrine glands	1·5	0·26	0·11
Breast	3·3	...	0·19
Respiratory system — Larynx and trachea	0·5	...	0·02
Respiratory system — Bronchi and bronchioles	9·2	0·26	0·23
Respiratory system — Other diseases	1·5	...	0·13
Teeth and gums	3·1	...	0·07
Digestive system — Inflammation of tonsils	18·2	...	0·35
Digestive system — Inflammation of pharynx	1·8	...	0·02
Digestive system — Inflammation of stomach	2·6	...	0·08
Digestive system — Gastric ulcer	1·3	...	0·14
Digestive system — Duodenal ulcer	0·3	...	0·03
Digestive system — Liver	0·8	...	0·05
Digestive system — Other diseases	51·5	0·51	1·72
Diseases due to disorders of nutrition or of metabolism	0·8	...	0·02
Diseases of the generative system	77·9	0·77	2·71
Diseases of bones, joints, muscles, fasciæ and bursæ	5·6	...	0·23
Diseases of the areolar tissue	10·0	...	0·25
Diseases of the skin	2·8	0·26	0·11
Diseases of the urinary system	7·9	...	0·28
Injuries — General	...	...	...
Injuries — Local	4·1	0·26	0·16
Injuries — In action	...	...	...
Tumours and cysts	5·1	...	0·23
Poisons	...	...	...
No appreciable disease	5·6	...	0·09
Suicides	...	...	...
Total	311·8	4·10	10·04

TABLE X.

BRITISH OTHER RANKS' CHILDREN.

INDIA.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick, during the year 1938.

Diseases.	Admissions.	Deaths.	Constantly sick.
Specific diseases due to infection or infestation.			
Common cold	9·9	...	0·15
Diphtheria	11·0	0·34	0·82
Dysentery	38·5	0·68	1·44
Enteric fevers (inclusive of typhoid, para A, B and C and enteric group).	1·0	...	0·18
Erysipelas	...	...	...
Influenza	5·1	...	0·11
Malaria	12·0	...	0·43
Measles	7·2	0·34	0·30
Meningococcal infection	0·2	..	0·02
Mumps	...	...	...
Pneumonia	7·5	1·88	0·32
Pyrexia of uncertain origin	0·2	...	0·00
Rheumatic fever	0·9	..	0·04
Sandfly fever	1·0	..	0·04
Scarlet fever	1·4	..	0·18
Smallpox	1·0	..	0·08
Tuberculosis — Pulmonary	0·2	..	0·12
Tuberculosis — Other	1·0	...	0·04
Venereal diseases — Gonorrhœa	..	..	..
Venereal diseases — Soft chancre	..	..	..
Venereal diseases — Syphilis	..	..	..
Venereal diseases — Other V. D.	..	..	..
Other diseases due to infection	7·5	0·51	0·48
Diseases due to infestation by metazoan parasites — Scabies	0·2	..	0·00
Diseases due to infestation by metazoan parasites — Other diseases	6·0	..	0·10
Other diseases classified under systems.			
Diseases of the nervous system	3·9	0·17	0·33
Mental diseases	0·5	..	0·02
Diseases of the—			
Eye	2·2	..	0·05
Ear and nose	12·7	..	0·42
Diseases of the circulatory system — Valvular disease of the heart	0·2	..	0·08
Diseases of the circulatory system — Disordered action of the heart	...	..	...
Diseases of the circulatory system — Other diseases	0·2	..	0·06
Diseases of the blood and blood forming organs	0·7	0·34	0·12
Diseases of ductless or endocrine glands	4·4	..	0·10
Diseases of the breast	..	..	..
Diseases of the respiratory system — Larynx and trachea	0·7	0·17	0·01
Diseases of the respiratory system — Bronchi and bronchioles	25·0	..	0·55
Diseases of the respiratory system — Other diseases	1·4	0·34	0·05

TABLE X—*contd.*

	Admissions.	Deaths.	Constantly sick.
Other diseases classified under systems—contd.			
Diseases of the teeth and gums	4·3	..	0·05
Diseases of the digestive system. — Inflammation of tonsils	32·9	..	0·59
Diseases of the digestive system. — Inflammation of pharynx	2·2	0·17	0·04
Diseases of the digestive system. — Inflammation of stomach	2·7	..	0·06
Diseases of the digestive system. — Gastric ulcer	..	..	..
Diseases of the digestive system. — Duodenal ulcer	..	..	..
Diseases of the digestive system. — Liver	0·7	0·17	0·02
Diseases of the digestive system. — Other diseases	86·9	1·86	1·78
Diseases due to disorders of nutrition or of metabolism	6·3	0·86	0·38
Diseases of the — Generative system	6·3	0·86	0·25
Diseases of the — Bones, joints, muscles, fascia and bursæ	3·8	..	0·40
Diseases of the — Areolar tissue	13·2	0·17	0·34
Diseases of the — Skin	6·2	..	0·22
Diseases of the — Urinary system	5·1	..	0·29
Injuries — General	1·4	0·51	0·01
Injuries — Local	4·4	..	0·50
Injuries — In action	..	..	..
Tumours and cysts	1·2	0·34	0·02
Poisons	..	..	..
No appreciable disease	3·3	..	0·11
Suicides	..	..	..
TOTAL	353·4	9·75	11·57

TABLE XI.

BRITISH OTHER RANKS.

Table showing admission and death ratios per 1,000 of strength by Commands contrasted with the previous year, and the average for the previous five years.

Commands.		Enteric group of fevers.		Influenza.		Cholera.		Smallpox.		Malaria.		Dysentery.	
		A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
Northern Command	1933-37	2·1	0·18	12·4	..	..	..	0·1	0·02	84·8	0·02	22·2	0·01
	1937	1·2	0·14	8·5	..	..	..	0·1	0·07	45·6	0·07	21·0	0·07
	1938	1·5	0·21	10·0	..	..	..	0·1	..	56·0	0·07	21·1	0·07
Western Command	1933-37	1·0	..	20·1	..	..	..	..	..	147·8	0·21	37·6	..
	1937	..	..	1·2	..	..	..	..	..	123·5	..	27·9	..
	1938		..	0·6	..	..	..	..	..	59·2	0·28	42·5	..
Eastern Command	1933-37	2·7	0·22	20·7	0·03	0·2	..	0·2	..	43·5	0·05	26·6	0·04
	1937	0·7	0·07	25·8	..	0·1	..	0·3	..	23·9	0·07	29·0	0·07
	1938	0·5	0·08	18·0	..	0·1	..	0·2	..	33·0	..	29·8	0·08
Southern Command	1933-37	0·8	0·07	11·9	0·01	..	..	0·1	..	50·8	0·05	26·2	..
	1937	0·6	0·07	18·3	..	..	..	0·1	..	43·2	..	25·5	..
	1938	0·8	0·08	15·5	..	..	..	0·1	..	60·0	0·08	25·6	..
All-India	1933-37	1·8	0·14	12·7	0·01	0·0	..	0·1	0·01	66·7	0·05	25·9	0·02
	1937	0·8	0·08	16·4	..	0·0	..	0·1	0·02	44·5	0·04	25·5	0·04
	1938	0·9	0·12	13·2	..	0·0	..	0·1	..	50·4	0·07	26·8	0·05

Commands.		Pyrexia of uncertain origin.		Pneumonia, lobar and lobular.		Venereal diseases.		Dengue.		Sandfly fever.		Plague	
		A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
Northern Command	1933-37	0·8	..	4·8	0·32	28·2	..	0·2	..	76·3	..	..	..
	1937	0·2	..	4·2	0·14	36·3	..	0·2	..	50·5	..	..	..
	1938	0·3	..	3·3	0·21	35·7	..	..	..	46·6	..	..	..
Western Command	1933-37	..	..	3·6	0·16	29·0	..	2·5	..	0·0	..	..	..
	1937	..	..	2·7	..	42·6	..	0·5	..	13·5	..	..	..
	1938	..	..	1·1	0·28	62·9	..	1·4	..	50·2	..	..	..
Eastern Command	1933-37	0·2	..	3·0	0·36	43·2	..	9·6	..	22·0	..	..	..
	1937	0·1	..	2·5	0·20	48·1	..	28·6	..	22·3	..	..	..
	1938	0·2	..	4·4	0·45	43·9	..	8·0	..	12·1	..	..	..
Southern Command	1933-37	1·0	..	2·8	0·24	35·2	..	10·5	..	10·7	..	..	..
	1937	0·1	..	3·2	0·28	35·5	..	9·8	..	5·0	..	..	..
	1938	0·2	..	2·8	0·25	52·4	..	4·6	..	5·0	..	..	..
All-India	1933-37	2·1	..	3·7	0·29	36·1	0.00	8·0	..	34·7	..	..	..
	1937	0·1	..	3·2	0·19	40·5	..	12·2	..	24·6	..	..	..
	1938	0·2	..	3·3	0·30	45·0	..	3·9	..	24·8	..	..	..

A.—Admissions. D.—Deaths.

TABLE XII.

VACCINATION PERFORMED IN THE BRITISH AND INDIAN ARMIES DURING 1938—OFFICERS AND OTHER RANKS.

Commands.	British Troops.							
	Officers.				Warrant and N. C. Officers and men.			
	Number.		Percentage of successful cases to total operations.		Number.		Percentage of successful cases to total operations.	
	P.	R.	P.	R.	P.	R.	P.	R.
Northern	1	244	100	87	54	5,520	94	87
Western	..	70	..	87	...	1,030	...	99
Eastern	..	212	..	72	254	4,560	97	70
Southern	6	197	83	66	155	4,684	96	60
Total	7	723	86	77	463	15,794	97	75

Commands.	Indian Troops.											
	King's Commissioned officers.				Indian commissioned, Non-commissioned officers and men.				Followers.			
	Number.		Percentage of successful cases to total operations.		Number.		Percentage of successful cases to total operations.		Number.		Percentage of successful cases to total operations.	
	P.	R.	P.	R.	P.	R.	P.	R.	P.	R.	P.	R.
Northern	..	330	..	90	15	26,457	100	86	4	5,265	100	83
Western	..	40	..	67	..	2,764	..	54	..	754	..	59
Eastern	2	111	100	66	384	10,658	80	70	68	1,633	84	1,095
Southern	..	92	..	71	147	5,317	91	67	13	2,967	100	64
Total	2	573	100	81	546	45,196	83	78	85	10,619	87	74

P.—Primary R.—Revaccination.

TABLE XIII.

VACCINATION PERFORMED IN THE FAMILIES—BRITISH ARMY DURING 1938.

Commands.	Women.				Children.			
	Number.		Percentage of successful cases to total operations.		Number.		Percentage of successful cases to total operations.	
	P.	R.	P.	R.	P.	R.	P.	R.
Northern . .	16	537	94	82	180	683	97	82
Western . .	1	126	100	96	61	155	97	97
Eastern . .	28	402	96	75	280	360	78	75
Southern . .	11	470	100	67	185	567	95	78
Total	56	1,535	96	77	706	1,765	89	79

P—Primary. R—Revaccination.

TABLE XIV.

VACCINATION PERFORMED IN THE FAMILIES—INDIAN ARMY DURING 1938.

Commands.	Women.				Children.			
	Number.		Percentage of successful cases to total operations.		Number.		Percentage of successful cases to total operations.	
	P.	R.	P.	R.	P.	R.	P.	R.
Northern . .	..	102	..	85	15	52	100	83
Western . .	..	6	..	83	3	7	100	57
Eastern . .	1	168	100	54	60	128	83	34
Southern . .	..	45	..	77	2	26	100	81
Total .	1	321	100	68	80	213	87	52

P—Primary. R—Revaccination.

SECTION II.

INDIAN ARMY, 1938.

TABLE B.

STATIONS BY COMMANDS AND INDEPENDENT DISTRICTS.

Stations.	*Height above M. S. level in feet.	Authority for height.	Points of reference.
Northern Command.			
Abbottabad	4,010	S. D.	Map.
Ambala	902	,,	S.B.M.
Amritsar	754	,,	,,
Bakloh	4,585	,,	Map.
Bannu	1,250	,,	,,
Campbellpore	1,180	,,	,,
Chitral	4,980	,,	,,
Dagshai	6,087	,,	,,
Dalhousie	7,687	,,	,,
Dera Ismail Khan	568	,,	S.B.M.
Dharamsala Cantt.	4,500	,,	Map.
Drosh Fort	4,340	,,	,,
Ferozepore	649	,,	S.B.M.
Jhelum	762	,,	,,
Jullundur Cantt.	771	,,	B.M.
Jutogh	6,370	,,	Map.
Kalabagh and Baragali	7,963	,,	,,
Kalabagh and Mari Indus	682	,,	,,
Kohat	1,725	,,	,,
Kuldana	7,049	S. G.	,,
Lahore Cantonment	706	S.D.	S.B.M.
Landikotal	3,509	,,	Map.
Lockhart Fort	6,613	,,	,,
Malakand	2,740	,,	,,
Manzai	1,650	,,	,,
Mardan	1,000	,,	,,
Mir Ali	2,240	S.G.	V.G.L.
Mona	3,500	S.D.	Map.
Multan	404	,,	S.B.M.
Nowshera (Ry. Station)	966	,,	B.M.
Peshawar	1,152	,,	S.B.M.
Rawalpindi	1,689	,,	,,
Razmak	6,556	,,	Map.
Risalpur	1,014	,,	B.M.
Shagai	3,174	,,	,,
Sargodha (Railway Rest House)	615	,,	,,
Sialkot	829	,,	,,
Solon	5,078	,,	,,
Thall	2,450	,,	Map.
Wana	4,530	,,	V.G.L.
Western Command.			
Chaman Fort	5,502	S.D.	Map.
Fort Sandeman	4,600	,,	,,
Hindubagh	5,821	,,	,,
Hyderabad (Sind)	96	,,	S.B.M.
Karachi (Holy Trinity Church)	28	,,	,,
Loralai	4,699	,,	Map.
Quetta	5,510	,,	S.B.M.

Stations.	*Height above M. S. level in feet.	Authority for height.	Points of reference.
Eastern Command.			
Agra (Fort)	525	S.D.	S.B.M.
Allpore	17	,,	B.M.
Allahabad	314	,,	S.B.M.
Almora	6,494	,,	Map.
Bareilly	563	,,	S.B.M.
Benares	256	,,	,,
Cawnpore	407	,,	B.M.
Chittagong	..	..	..
Comilla	..	..	..
Dacca	20	M.D.	..
Dehra Dun	2,232	S.D.	S.B.M.
Delhi	757	,,	,,
Dinapore	170	,,	Church
Fatehgarh	467	,,	,,
Fyzabad	330	,,	S.B.M.
Ghoom	7,313	,,	Jn. of road.
Gyantse	13,120	,,	Map.
Gorakhpore	..	..	..
Jhansi	849	S.D.	S.B.M.
Lansdowne	5,823	,,	Map.
Lucknow	383	,,	B.M.
Meerut	737	,,	S.B.M
Midnapore	..	..	..
Muttra	560	S.D.	S.B.M.
Nowgong	735	,,	B.M.
Roorkee	879	,,	S.B.M.
Saidpur	..	..	..
Shillong	4,921	S.D.	Map.
Southern Command.			
Ahmedabad	162	S.D.	S.B.M.
Ahmednagar	2,180	,,	Map.
Aurangabad	1,905	M.D.	,,
Bangalore	3,002	S.D.	S.B.M.
Baroda	114	,,	B.M.
Belgaum	2,523	,,	S.B.M.
Bombay (town hall)	20	,,	,,
Cannanore	40	,,	..
Deolali	1,894	,,	S.B.M.
Jubbulpore	1,320	,,	,,
Kamptee (Rly. Station)	940	,,	B.M.
Mhow (Ry. Station)	1,887	,,	..
Mount Abu (Sanitorium)	3,836	,,	..
Nasirabad	1,461	,,	B.M.
Pachmarhi	3,490	,,	,,
Poona	1,867	,,	S.B.M.
Saugor	1,755	,,	,,
St. Thos. Mount (Ry. Station)	34	,,	B.M.
Trichinopoly	256	,,	S.B.M.
Trimulgherry	1,843	,,	Map.
Wellington Stn. Hospl.	5,800	,,	,,

* These heights are usually those of the survey-marks or of the mercury surface in barometer cisterns of meteorological observatories.

S. D. = Survey Department (Map Publication Office).
S. G. = Surveyor-General of India.
S.B.M. = Standard Bench Mark.
V.G.L. = Village Ground Level.
M.D. = Meteorological Department.
B.M. = G. T. Bench Mark.
Map. = Heights taken from Topo. Maps.

TABLE XV.

INDIAN OFFICERS AND INDIAN OTHER RANKS.

ALL-INDIA.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick, during the year 1938.

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Specific diseases due to infection or infestation.				
Common cold	11·6	..	..	0·21
Diphtheria	0·1	..	..	0·00
Dysentery	17·2	0·03	..	0·65
Enteric fevers (inclusive of typhoid, para A, B & C and enteric group).	0·8	0·07	..	0·12
Erysipelas	0·0	..	..	0·00
Influenza	4·4	..	..	0·11
Malaria	109·7	0·05	0·04	2·77
Measles	1·7	..	..	0·09
Meningococcal infection	0·2	0·07	0·01	0·02
Mumps	4·7	0·01	..	0·24
Pneumonia	5·0	0·43	0·01	0·41
Pyrexia of uncertain origin	0·0	..	..	0·00
Rheumatic fever	0·7	..	0·03	0·00
Sandfly fever	4·6	..	..	0·10
Scarlet fever	0·2	0·01	..	0·01
Smallpox				
Tuberculosis — Pulmonary	1·7	0·12	1·43	0 21
Tuberculosis — Other	0·4	0·04	0 18	0 07
Venereal Diseases — Gonorrhœa	2·9	..	0·02	0·30
Venereal Diseases — Soft chancre	1·5	..	..	0·14
Venereal Diseases — Syphilis	3·1	..	0·04	0·27
Venereal Diseases — Other V. D.	...	..	..	...
Other diseases due to infection	5·9	0·11	0·06	0·40
Diseases due to infestation by metazoan parasites — Scabies	11·2	..	..	0·36
Diseases due to infestation by metazoan parasites — Other diseases	7·5	...	0·02	0·37
Other diseases classified under systems.				
Diseases of the nervous system	3·5	0·06	0·37	0·19
Mental diseases	0·9	..	0·37	0·09
Diseases of the eye	11·5	..	0·48	0·47
Diseases of the ear and nose	8·3	0·01	0·09	0·26
Diseases of the circulatory system — Valvular disease of the heart	0·1	...	0·06	0·01
Diseases of the circulatory system — Disordered action of the heart	0·4	0·04	0·02	0·02
Diseases of the circulatory system — Other diseases	0·5	0·11	0·05	0·04
Diseases of blood and blood forming organs	4·2	0·05	0·07	0·25
Diseases of ductless or endocrine glands	0·1	..	0·04	0·01
Diseases of the breast	...	..	..	0·00
Diseases of the respiratory system — Larynx and trachea	0·7	..	..	0·02
Diseases of the respiratory system — Bronchi & bronchioles	13·0	..	0·08	0·44
Diseases of the respiratory system — Other diseases	2·4	0·04	0·09	0·22
Diseases of the teeth and gums	3·1	..	0·01	0·06
Diseases of the digestive system — Inflammation of the tonsils	6·1	..	..	0·15
Diseases of the digestive system — Inflammation of pharynx	19·3	..	..	0·39
Diseases of the digestive system — Inflammation of stomach	1·1	0·01	..	0·05
Diseases of the digestive system — Gastric ulcer	0·1	0·01	0·01	0·01
Diseases of the digestive system — Duodenal ulcer	0·0	0·0	..	0·00
Diseases of the digestive system — Liver diseases	1·2	0·04	0·01	0·08
Diseases of the digestive system — Other diseases	23·9	0·12	0·05	0·79

TABLE XV—*contd.*

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Other diseases classified under systems—contd.				
Diseases due to disorders of nutrition or of metabolism	0·2	0·01	0·06	0·01
Diseases of the generative system	2·3	..	0·08	0·13
Diseases of bones, joints, muscles, etc.	0·9	..	0·34	0·45
Diseases of the areolar tissue	31·8	0·02	0·01	1·02
Diseases of the skin	16·2	..	0·04	0·06
Diseases of the urinary system	3·2	0·4	0·10	0·17
Injuries—General	0·4	0·08	0·01	0·01
Injuries—Local	59·0	0·40	1·43	2·68
Injuries—In action	...	...	..	...
Tumours and cysts	1·3	0·03	0·10	0·06
Poisons	0·2	0·05	..	0·01
No appreciable disease	0·9	..	0·02	0·04
Suicides*	0·0	0·12	..	0·00
Total	428·8	2·21	5·83	15·78

*The figures against "Suicides" having already been shown under the heading of the injury, etc., which caused death, are not included in the total.

TABLE XVI.

INDIAN OFFICERS AND INDIAN OTHER RANKS—*contd.*

NORTHERN COMMAND.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick, during the year 1938.

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Specific diseases due to infection or infestation.				
Common cold	7·6	...	...	0·14
Diphtheria	0·0	...	...	0·00
Dysentery	16·9	0·04	...	0·61
Enteric fevers (inclusive of typhoid, para A, B & C, and enteric group).	0·8	0·09	...	0·11
Erysipelas	0·0	...	...	0·00
Influenza	4·2	...	...	0·10
Malaria	132·8	0·05	0·05	3·17
Measles	1·3	...	...	0·07
Meningococcal infection	0·8	0·14	0 02	0·04
Mumps	4·7	...	...	0·24
Pneumonia	6·0	0·63	0·02	0·50
Pyrexia of uncertain origin	0·0	...	...	0·00
Rheumatic fever	0·9	...	0·02	0·06
Sandfly fever	7·0	...	...	0·14
Scarlet fever	...	...	...	...
Smallpox	0·2	...	...	0·01
Tuberculosis — Pulmonary	1·6	0·14	1·32	0·20
Tuberculosis — Other	0·4	0·05	0·20	0·09
Venereal diseases — Gonorrhœa	2·1	...	0·02	0·28
Venereal diseases — Soft chancre	1·4	...	...	0·11
Venereal diseases — Syphilis	2·1	...	0·02	0·20
Venereal diseases — Other V. D.	...	...	...	...
Other diseases due to infection	5·3	0·19	0·04	0·40
Diseases due to infestation by metazoan parasites — Scabies	10·5	...	...	0·35
Diseases due to infestation by metazoan parasites — Other diseases	7·0	...	...	0·37
Other diseases classified under systems.				
Diseases of the nervous system	3·0	0·04	0·24	0·15
Mental diseases	0·8	...	0·33	0·07
Diseases of the :—				
Eye	11·3	...	0·43	0·47
Ear and nose	6·6	0·02	0·04	0·25
Disease of the circulatory system — Valvular disease of the heart	0·0	...	0·04	0·00
Disease of the circulatory system — Disordered action of the heart	0·5	0·02	0·04	0·03
Disease of the circulatory system — Other diseases	0·5	0·07	0 05	0·05
Disease of blood and blood forming organs	4·7	0·05	0·07	0·27
Diseases of ductless or endocrine glands	0·2	...	0·05	0·01
Diseases of the breast	...	...	...	...
Diseases of the respiratory system — Larynx and trachea	0·8	...	...	0·03
Diseases of the respiratory system — Bronchi and bronchioles	12·4	...	0·05	0·41
Diseases of the respiratory system — Other diseases	2·8	0·05	0·04	0·25
Diseases of the teeth and gums	3·6	...	...	0·10
Diseases of the digestive system — Inflammation of tonsils	6·3	...	...	0·16
Diseases of the digestive system — Inflammation of pharynx	22·4	...	...	0·44
Diseases of the digestive system — Inflammation of stomach	0·9	0·02	...	0·04
Diseases of the digestive system — Gastric ulcer	0·0	...	...	0·00
Diseases of the digestive system — Duodenal ulcer	0·0	...	...	0·00
Diseases of the digestive system — Liver diseases	0·9	0·05	...	0·06
Diseases of the digestive system — Other diseases	22·8	0·11	0·07	0·75
Diseases due to disorders of nutrition or of metabolism	0·1	...	·02	0·01
Diseases of the generative system	2·2	...	...	0·12
Diseases of bones, joints, muscles, etc.	9·4	...	0·31	0·42
Diseases of the areolar tissue	30·4	0·04	...	0·98
Diseases of the skin	13·9	...	...	0·60
Diseases of the urinary system	3·3	0·04	0·11	0·18
Injuries — General	0·5	0·07	...	0·01
Injuries — Local	56·3	0·43	1·59	2·68
Injuries — In action.	1·7	0·27	0·14	0·12
Tumours and cysts	1·4	0·04	0·09	0·07
Poisons	0·3	0·04	...	0·00
No appreciable disease	0·8	...	...	0·04
Suicides*	0·1	0·13	...	0·00
Total	434·1	2·73	5·41	15·94

* The figures against "Suicides" having already been shown under the heading of the injury, etc., which caused death, are not included in the total.

TABLE XVII.

INDIAN OFFICERS AND INDIAN OTHER RANKS—*contd.*

WESTERN COMMAND.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick, during the year 1938.

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Specific diseases due to infection or infestation.				
Common cold	14·5	..	..	0·28
Diphtheria	..	..	..	..
Dysentery	18·8	..	..	0·76
Enteric fever (inclusive of typhoid, para. A, B & C and enteric group).	1·1	..	..	0·21
Erysipelas	..	..	..	..
Influenza	0·1	..	..	0·00
Malaria	87·2	0·09	..	2·76
Measles	2·7	..	..	0·15
Meningococcal infection	..	..	..	..
Mumps	3·9	..	..	0·25
Pneumonia	2·8	0·27	..	0·22
Pyrexia of uncertain origin	..	..	..	..
Rheumatic fever	0·5	..	0·9	0·07
Sandfly fever	5·7	..	..	0·12
Scarlet fever	..	..	..	..
Smallpox	..	..	..	..
Tuberculosis — Pulmonary	1·3	0·18	1·06	0·19
Tuberculosis — Other	0·2	..	..	0·02
Venereal diseases — Gonorrhœa	3·3	..	..	0·31
Venereal diseases — Soft chancre	1·3	..	..	0·12
Venereal diseases — Syphilis	1·9	..	..	0·20
Venereal diseases — Other V. D.	..	..	..	..
Other diseases due to infection	4·3	..	..	0·29
Diseases due to infestation by metazoan parasites — Scabies	8·0	..	..	0·35
Diseases due to infestation by metazoan parasites — Other diseases	6·3	..	..	0·34
Other diseases classified under systems.				
Diseases of the nervous system	2·9	0·18	..	0·17
Mental diseases	0·9	..	0·27	0·09
Diseases of the eye	8·2	..	0·53	0·48
Diseases of the ear and nose	3·7	..	0·18	0·18
Diseases of the circulatory system — Valvular disease of the heart	0·2	..	0·18	0·03
Diseases of the circulatory system — Disordered action of the heart	0·4	0·09	..	0·03
Diseases of the circulatory system — Other diseases	0·4	0·18	0·09	0·04
Diseases of the blood and blood forming organs	3·9	0·09	..	0·25
Diseases of the ductless or endocrine glands	0·1	..	0·09	0·02
Diseases of the breast	..	..	..	..
Diseases of the respiratory system — Larynx and trachea	0·6	..	..	0·03
Diseases of the respiratory system — Bronchi and bronchioles	12·1	..	..	0·45
Diseases of the respiratory system — Other diseases.	2·0	..	..	0·21
Diseases of the teeth and gums	1·9	..	..	0 04
Diseases of the digestive system — Inflammation of tonsils	5·6	..	..	0·12
Diseases of the digestive system — Inflammation of pharynx	20·6	..	..	0·39
Diseases of the digestive system — Inflammation of stomach	1·2	..	..	0·05
Diseases of the digestive system — Gastric ulcer	..	..	..	..
Diseases of the digestive system — Duodenal ulcer	..	..	..	..
Diseases of the digestive system — Liver diseases	0·5	0·09	..	0·06
Diseases of the digestive system — Other diseases	26·2	0·09	..	0·96
Diseases due to disorders of nutrition or of metabolism	0·3	..	0·09	0·04
Diseases of the generative system	1·9	..	..	0·13
Diseases of bones, joints, muscles, etc.	7·0	..	0·35	0·43
Diseases of the areolar tissue	16·8	..	..	0·63
Diseases of the skin	10·1	..	..	0·38
Diseases of the urinary system	3·1	..	0·09	0·17
Injuries — General	0·4	0·09	0·09	0·01
Injuries — Local	44·2	0·27	0·44	1·60
Injuries — In action	..	..	..	..
Tumours and cysts	0·7	..	..	0·02
Poisons	..	..	..	..
No appreciable disease	0·9	..	..	0·02
Suicides	..	..	..	..
Total	340·8	1·59	3·54	13·72

TABLE XVIII.

INDIAN OFFICERS AND INDIAN OTHER RANKS—*contd.*

EASTERN COMMAND.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick, during the year 1938.

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Specific diseases due to infection or infestation.				
Common cold	21·9	...	...	0·37
Diphtheria	...	...	...	...
Dysentery	16·5	0·04	...	0·63
Enteric fever (inclusive of typhoid, para. A, B & C and enteric group)	0·5	0·12	...	0·11
Erysipelas	0·0	...	...	0·00
Influenza	1·3	...	...	0·03
Malaria	92·3	0·08	0·04	2·77
Measles	3·4	...	...	0·17
Meningococcal infection	0·1	...	...	0·02
Mumps	6·8	0·04	...	0·34
Pneumonia	5·3	0·23	...	0·45
Pyrexia of uncertain origin	0·0	...	...	0·00
Rheumatic fever	0·3	...	0·04	0·03
Sandfly fever	2·2	...	...	0·06
Scarlet fever	...	...	...	...
Small pox	0·3	0·04	...	0·02
Tuberculosis — Pulmonary	2·0	0·12	1·76	0·29
Tuberculosis — Other	0·3	...	0·12	0·06
Venereal diseases — Gonorrhœa	3·5	...	...	0·35
Venereal diseases — Soft chancre	1·4	...	...	0·17
Venereal diseases — Syphilis	4·1	...	0·08	0·39
Venereal diseases — Other V. D.	...	...	...	...
Other diseases due to infection	4·1	...	0·16	0·35
Diseases due to infestation by metazoan parasites — Scabies	12·9	...	...	0·38
Diseases due to infestation by metazoan parasites — Other diseases	7·8	...	0·04	0·32
Other diseases classified under systems.				
Diseases of the nervous system	3·8	0·04	0·74	0·24
Mental diseases	1·1	...	0·23	0·11
Diseases of the eye	14·5	...	0·70	0·57
Diseases of the ear and nose	10·8	...	0·12	0·26
Diseases of the circulatory system — Valvular disease of the heart	0·0	...	0·04	0·00
Diseases of the circulatory system — Disordered action of the heart	0·2	...	...	0·01
Diseases of the circulatory system — Other diseases	0·8	0·20	...	0·05
Diseases of the blood and blood forming organs	2·9	0·04	0·12	0·18
Diseases of ductless or endocrine glands	0·2	...	...	0·00
Diseases of the breast	...	...	...	0·00
Diseases of the respiratory system — Larynx and trachea	0·8	...	...	0·02
Diseases of the respiratory system — Bronchi and bronchioles	15·5	...	0·12	0·53
Diseases of the respiratory system — Other diseases	2·2	0·04	0·16	0·19
Diseases of the teeth and gums	2·9	...	0·04	0·07
Diseases of the digestive system — Inflammation of tonsils	6·0	...	...	0·15
Diseases of the digestive system — Inflammation of pharynx	18·1	...	...	0·36
Diseases of the digestive system — Inflammation of stomach	0·7	...	...	0·02
Diseases of the digestive system — Gastric ulcer	0·1	0·0	...	0·00
Diseases of the digestive system — Duodenal ulcer	0·0	...	...	0·00
Diseases of the digestive system — Liver diseases	1·4	0·04	...	0·08
Diseases of the digestive system — Other diseases	27·5	0·16	...	0·83
Diseases due to disorders of nutrition or of metabolism	0·2	...	0·04	0·01
Diseases of the generative system	2·5	...	0·08	0·09
Diseases of bones, joints, muscles, etc.	10·7	...	0·31	0·46
Diseases of the areolar tissue	37·9	...	...	1·19
Diseases of the skin	19·3	...	0·04	0·76
Diseases of the urinary system	3·0	0·08	0·04	0·15
Injuries — General	0·3	0·04	...	0·01
Injuries — Local	66·1	0·35	1·64	3·15
Injuries — In action	...	...	...	...
Tumours and cysts	1·4	0·04	0·12	0·08
Poisons	0·1	0·08	...	0·00
No appreciable disease	0·7	...	0·08	0·02
Suicides*	...	0·16	...	...
Total	439·0	1·80	6·83	16·92

*The figures against "Suicides" having already been shown under the heading or the injury, etc. which caused death, are not included in the total.

TABLE XIX.

INDIAN OFFICERS AND INDIAN OTHER RANKS—*contd.*

SOUTHERN COMMAND.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick, during the year 1938.

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Specific diseases due to infection or infestation				
Common cold	8·0	...	...	0·14
Diphtheria	0·2	...	...	0·02
Dysentery	18·3	...	...	0·70
Enteric fever (inclusive of typhoid, para. A, B & C, and enteric group)	0·7	...	...	0·09
Erysipelas	...	...	...	...
Influenza	11·2	...	...	0·27
Malaria	80·7	...	0·05	1·66
Measles	0·3	...	...	0·02
Meningococcal infection	0·1	...	...	0.00
Mumps	2·4	...	...	0·13
Pneumonia	3·2	0·20	...	0·24
Pyrexia of uncertain origin	0·1	...	...	0·01
Rheumatic fever	0·7	...	...	0·06
Sandfly fever	0·4	...	...	0·01
Scarlet fever	...	...	...	...
Smallpox	0·2	...	...	0·01
Tuberculosis — Pulmonary	1·7	0·05	1·50	0·14
Tuberculosis — Other	0·4	0·05	0·30	0·04
Venereal diseases — Gonorrhoea	4·0	...	0·05	0·40
Venereal diseases — Soft chancre	2·2	...	...	0·16
Venereal diseases — Syphilis	5·1	...	0·05	0·37
Venereal diseases — Other V. D.	...	...	...	...
Other diseases due to infection	10·7	0·10	0·05	0·52
Diseases due to infestation by metazoan parasities — Scabies	12·8	...	...	0·40
Diseases due to infestation by metazoan parasities — Other diseases	9·1	...	0·05	0·43
Other diseases classified under systems.				
Diseases of the nervous system	4·9	0·10	0·50	0·24
Mental diseases	1·0	...	0·70	0·09
Diseases of the eye	10·0	...	0·30	0·34
Diseases of the ear and nose	12·2	...	0·15	0·34
Diseases of the circulatory system. — Valvular disease of the heart	0·2	...	0·10	0·02
Diseases of the circulatory system. — Disordered action of the heart	0·3	0·10	...	0·01
Diseases of the circulatory system. — Other diseases	0·3	0·10	0·10	0·02
Diseases of the blood and blood forming organs	4·8	0·05	0·05	0·31
Diseases of ductless or endocrine glands	...	...	...	...
Diseases of the breast	...	...	...	...
Diseases of the respiratory system. — Larynx and trachea	0·3	...	...	0·01
Diseases of the respiratory system. — Bronchi and bronchioles	12·2	...	0·15	0·41
Diseases of the respiratory system. — Other diseases	1·8	0·05	0·20	0·15
Diseases of the teeth and gums	3·0	...	...	0·07
Diseases of the digestive system. — Inflammation of the tonsils	5·9	...	...	0·16
Diseases of the digestive system. — Inflammation of the pharynx	11·4	...	...	0·30
Diseases of the digestive system. — Inflammation of stomach	2·3	...	...	0·10
Diseases of the digestive system. — Gastric ulcer	0·2	...	0·05	0·01
Diseases of the digestive system. — Duodenal ulcer	...	...	...	...
Diseases of the digestive system. — Liver diseases	1·8	...	0·05	0·11
Diseases of the digestive system. — Other diseases	21·2	...	0·10	0·76
Diseases due to disorders of nutrition or of metabolism	0·3	0 05	0·20	0·02
Diseases of the generative system	2·9	...	0·05	0·20
Diseases of bones, joints, muscles, etc.	11·9	...	0·45	0·49
Diseases of the areolar tissue	36·5	...	0·05	1·15
Diseases of the skin	22·4	...	0·15	0·84
Diseases of the urinary system	2·9	0·05	0·15	0·20
Injuries — General	0·3	0·15	...	0·01
Injuries — Local	65·7	...	1·25	2·61
Injuries — In action	...	...	...	...
Tumours and cysts	1·5	...	0·15	0·06
Poisons	0·2	...	...	0·01
No appreciable disease	1·4	...	...	0·07
Suicides*	...	0·15	...	...
Total	411·8	1·65	6·97	15·01

* The figures against "Suicides" having already been shown under the heading of the injury, etc., which caused death, are not included in the total.

TABLE XX.

INDIAN OFFICERS AND INDIAN OTHER RANKS—*contd.*

Table showing monthly ratios per 1,000 of strength of admissions for certain diseases for All-India during the year 1938.

Months.	Enteric group of fevers.	Influenza.	Cholera.	Smallpox.	Malaria.	Dysentery protozoal.	Dysentery bacillary.	Dysentery bacillary exudate.	Dysentery group.	Pyrexia of uncertain origin.	Pneumonia lobar and lobular.	Diarrhœa.	Dengue.	Sandfly fever.	Plague.	Effects of heat.	All causes.
January	0·1	0·6	...	0·04	2·8	0·02	0·3	0·1	0·1	...	0·7	0·1	0·7	...	...	...	26·8
February	0·08	0·2	...	0·01	1·6	0·05	0·08	0·01	0·01	...	0·4	0·01	0·03	0·03	...	0·01	20·8
March	0·04	0·1	...	0·04	2·2	0·03	0·2	0·1	0·1	0·01	0·4	0·2	0·02	0·06	...	...	23·0
April	0·03	0·2	0·01	0·04	3·7	0·1	0·9	0·2	0·3	...	0·2	0·8	0·02	0·3	...	...	27·7
May	0·04	0·2	0·02	0·01	5·5	0·1	1·1	0·2	0·5	0·01	0·3	1·2	...	1·0	...	0·05	32·4
June	0·1	0·1	0·01	...	8·9	0·1	1·1	0·3	0·3	...	0·2	1·1	0·04	0·8	...	0·05	36·9
July	0·1	0·2	...	...	12·7	0·1	1·9	0·3	1·3	...	0·3	1·0	0·0	0·7	...	0·1	43·3
August	0·1	0·3	0·3	0·01	17·1	0·1	1·7	0·4	0·7	...	0·2	0·9	0·02	1·0	...	0·04	48·2
September	0·1	0·4	...	0·02	19·8	0·04	1·2	0·3	0·3	...	0·3	0·6	0·1	0·5	...	0·01	47·5
October	0·1	0·6	...	...	17·3	0·04	0·7	0·2	0·4	0·02	0·3	0·6	0·01	0·3	...	0·01	44·3
November	0·04	0·2	...	0·03	13·3	0·03	0·9	0·2	0·3	0·01	0·5	0·5	0·02	0·03	...	...	38·4
December	0·1	1·2	...	0·01	5·0	0·03	0·3	0·1	0·2	...	1·0	0·4	0·03	0·02	...	...	34·1
Total	0·8	4·4	0·4	0·2	109·7	0·8	10·5	2·2	3·7	0·04	5·0	7·5	1·1	4·6	...	0·2	422·1

TABLE

INDIAN OFFICERS AND

Table showing ratios per 1,000 of strength of admissions for certain

Stations and Districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para A.	Para B.	Para C.	Enteric group.	Bacillary.	Bacillary exudate.	Protozoal.	Clinical.
Chitral	..	..	..	..	..	..	..	..	..
Drosh Fort	..	..	..	..	..	..	..	..	1·2
Landikotal	..	..	..	..	0·5	1·6	2·2	..	2·2
Malakand	..	..	..	..	..	4·0	..	..	..
Mardan	..	1·1	..	..	1·1	1·1	..	..	5·5
Nowshera	0·4	0·4	..	..	..	1·2	1·6	..	9·1
Peshawar	0·2	0·2	..	..	..	13·3	2·8	0·4	5·7
Risalpur	..	1·2	..	..	1·2	12·2	4·9	..	7·3
Shagai	..	..	..	..	..	..	..	..	1·7
Total Peshawar Distt.	0·1	0·3	..	..	0·2	6·6	2·0	0·1	5·1
Fort Lockhart	..	..	..	..	..	3·0	..	..	..
Kohat	0·5	..	..	..	0·3	10·6	1·6	0·5	1·6
Thal	1·0	..	..	..	3·1	2·1	..	..	..
Total Kohat District	0·6	..	..	..	0·8	8·4	1·2	0·4	1·2
Abbottabad	0·4	..	..	..	0·4	7·7	2·2	2·2	1·1
Campbellpore	..	..	..	..	..	..	..	..	..
Jhelum	0·8	..	..	..	..	12·6	..	..	6·7
Kalabagh	..	..	..	..	..	..	..	..	..
Kuldana	..	..	..	..	..	3·5	..	..	..
Mona	..	..	..	..	..	..	..	..	..
Rawalpindi	0·2	0·2	..	..	0·2	9·1	2·6	..	7·4
Sargodha	..	..	..	..	..	..	..	..	..
Total Rawalpindi District	0·3	0·1	..	..	0·2	8·7	2·0	0·7	4·9
Ambala	..	..	..	..	0·4	10·0	..	5·2	1·2
Amritsar	..	..	..	..	..	7·0	14·1	..	..
Bakloh	1·4	..	..	..	1·4	1·4	..	..	1·4
Dagshai	..	..	..	..	..	..	76·9	..	..
Dalhousie	..	..	..	..	..	..	..	..	..
Dharamsala	..	..	..	..	1·6	3·2	..	..	3·2
Ferozepore	0·5	..	..	..	..	2·6	0·5	0·5	2·1
Jullundur	..	..	..	..	..	0·7	2·1	0·7	4·3
Jutogh	..	..	..	..	..	..	..	..	..
Lahore	1·3	..	..	..	0·4	5·6	2·2	..	8·7
Multan	..	..	..	..	..	5·5	11·1	..	5·5
Sialkot	2·4	..	..	..	..	4·8	3·0	..	1·2
Total Lahore District	0·8	0·2	..	..	0·3	4·9	1·9	1·3	3·4

XXI.

INDIAN OTHER RANKS.

diseases in each Station and District in India during the year 1938.

Diarrhœa.	Cholera.	Venereal diseases.	Smallpox.	Malaria.	Dengue.	Sandfly fever.	Common cold.	Influenza.	Pneumonia, lobar, and lobular.	Heat-stroke.	Heat-exhaustion.	All Causes.	Constantly sick.
..	..	..	..	54·1	..	..	6·8	..	..	..	..	197·3	6·67
1·2	..	..	..	40·9	..	12·2	1·2	..	3·7	..	..	235·1	7·53
8·7	..	3·8	..	83·8	..	10·3	2·7	9·2	4·9	..	..	399·3	12·71
..	..	1·3	..	157·3	..	22·7	13·3	..	4·0	..	..	374·7	10·89
3·3	..	8·8	1·1	155·9	..	4·4	..	..	6·6	..	..	397·4	13·07
6·3	..	3·6	0·4	53·4	..	4·7	16·2	3·2	6·3	0·4	2·0	430·5	14·27
5·1	..	7·2	0·6	106·0	..	22·6	7·0	0·8	5·1	0·2	..	346·9	15·39
7·3	..	2·4	..	40·3	..	15·9	2·4	7·3	3·7	..	3·7	280·0	7·63
5·0	..	9·9	..	231·8	..	1·7	8·3	..	5·0	..	1·7	518·2	10·61
5·3	..	5·2	0·4	97·1	..	14·2	7·4	2·6	5·1	0·1	0·7	369·5	13·19
..	..	..	..	65·9	..	..	6·0	..	..	..	..	308·4	9·22
12·8	0·8	3·5	0·8	217·2	..	1·4	24·2	..	5·2	..	0·3	530·4	19·88
5·1	..	4·1	..	264·1	..	4·1	..	..	2·1	..	..	508·7	12·81
10·4	0·6	3·4	0·6	216·2	..	1·8	13·2	..	4·2	..	0·2	507·7	17·76
1·1	..	7·7	..	186·6	..	10·7	2·9	4·8	9·6	..	..	540·3	14·07
..	..	..	..	..	..	..	..	14·7	44·1	..	..	205·9	4·12
5·0	..	9·2	..	309·8	..	10·1	2·5	9·2	7·6	..	..	542·4	14·60
..	..	..	..	346·9	..	..	..	..	..	..	..	408·2	10·20
..	..	..	..	45·8	..	..	17·6	..	3·5	..	..	147·9	18·31
..	..	..	..	111·1	..	..	..	..	..	..	..	688·9	12·89
4·4	..	7·2	..	159·8	..	5·8	2·6	3·3	9·3	..	..	462·1	18·26
..	..	..	..	71·4	..	..	..	..	23·8	..	..	690·5	13·33
3·2	..	7·2	..	184·1	..	7·6	3·1	4·5	9·2	..	..	487·2	16·24
4·0	0·4	6·8	..	40·2	..	..	8·4	..	7·6	..	0·4	336·8	12·98
14·1	..	..	..	77·5	..	..	14·1	..	..	..	..	302·8	9·44
1·4	..	12·2	..	174·8	..	5·4	6·8	5·4	1·4	..	..	506·8	18·89
..	..	..	..	..	..	..	..	..	..	..	..	230·8	41·54
..	..	..	..	83·3	..	..	..	..	..	..	..	333·3	56·67
..	..	3·2	..	172·6	..	..	..	..	8·2	..	..	316·1	10·13
2·6	..	4·2	..	42·2	..	..	6·9	53·8	10·5	..	..	370·3	12·70
2·1	..	5·7	1·4	62·6	..	..	43·4	..	6·4	..	..	363·4	13·54
23·8	..	7·9	..	15·9	..	..	..	..	..	..	..	230·2	6·43
14·7	..	7·8	..	87·2	..	..	2·6	..	7·4	..	0·4	376·0	16·21
..	..	12·9	..	83·2	..	5·5	1·8	..	1·8	..	..	292·1	10·59
19·9	..	4·2	..	42·8	..	..	4·8	..	4·8	..	..	345·8	13·86
7·6	0·1	6·4	0·2	69·9	..	0·6	9·8	8·9	6·4	..	0·2	359·7	13·81

TABLE

Stations and Districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para A.	Para B.	Para C.	Enteric group.	Bacillary.	Bacillary exudate.	Protozoal.	Clinical.
Bannu	..	0·5	..	..	0·5	12·6	3·7	1·6	7·9
D. I. Khan	..	..	..	..	..	..	10·1	..	..
Mari Indus	..	..	..	..	..	12·0	..	..	..
Manzai	..	..	..	..	..	16·4	5·0	..	8·8
Razmak	..	0·2	..	0·2	0·2	32·7	4·2	1·2	6·0
Wana	0·3	..	..	..	..	4·9	0·5	..	1·8
Mirali	0·4	..	..	..	0·8	2·1	0·4	..	2·1
Total Waziristan District	0·1	0·1	..	0·1	0·3	17·6	2·7	0·7	4·7
Chaman	1·5	..	..	..	..	3·9	2·3	..	3·1
Quetta	0·9	0·2	..	..	0·4	16·3	2·5	..	6·4
Total Baluchistan District	1·1	0·2	..	..	0·4	13·4	2 5	..	5·7
Fort Sandeman	..	..	..	..	0·5	4·2	2·8	1·8	6·9
Hindubagh	..	..	..	..	..	37·7	..	..	3·8
Loralai	1·0	..	..	..	..	2·0	1·0	..	..
Total Zhob Bde.	0·3	..	.	..	0·3	6·1	2·0	1·2	4·7
Hyderabad	..	..	..	..	..	3·4	3·4	..	3·4
Karachi	..	0·6	..	..	..	9·4	3·7	1·2	8·1
Total Sind Bde. Area	..	0·5	..	..	..	7·8	3·7	0·9	6·8
Bareilly	..	..	..	..	..	14·5	1·6	1·6	1·6
Dehra Dun	..	..	..	..	0·6	3·3	1·8	1·8	1·2
Jhansi	..	..	..	..	0·4	39·7	4·0	0·4	4·4
Landsdowne	0·5	..	..	..	0·5	5·5	0·5	..	2·0
Meerut	1·7	..	..	..	..	13·9	1·3	..	0·4
Nowgong	..	..	..	..	..	13·2	13·2	..	..
Roorkee	..	..	..	..	..	4·4	..	..	..
Total Meerut District	0·4	..	..	..	0·3	12·9	1·7	0·7	1·6
Almora	1·4	..	..	..	..	16·8	..	..	5·6
Allahabad	..	..	..	..	..	18·9	..	1·5	1.5
Benares	..	..	..	..	..	..	..	..	..
Cawnpore	..	..	..	..	..	..	..	..	..
Fatehgarh	..	..	1·4	..	..	9·9	..	4·2	12·7
Fyzabad	..	..	..	..	..	..	..	..	..
Gorakhpur	..	..	..	..	..	..	..	..	..
Lucknow	..	0·5	..	..	..	9·5	1·0	3·5	1·5
Total Lucknow District	0·2	0·2	0·2	..	..	10·2	0·4	2·2	3·3
Allpore	..	..	..	..	..	17·3	4·0	1·3	..
Chittagong	..	..	..	..	..	10·8	2·7	..	..
Comilla	..	..	..	..	..	4·6	..	..	4·6
Dacca	..	..	..	..	..	4·6	..	..	4·6
Dinapore	..	..	..	..	..	..	62·5	..	..
Ghoom	..	..	..	..	..	..	..	..	..
Gyantse	..	..	..	..	..	..	..	..	..
Midnapore	..	..	..	..	..	7·2	2·4	..	..
Saidpur	..	..	..	..	..	15·7	..	..	..
Shillong	..	..	..	..	..	11·7	3·9	2·8	1·7
Total P. & A. District.	..	..	..	..	..	10·7	3·0	1·4	1·

XXI—*contd.*

Diarrhœa.	Cholera.	Venereal diseases.	Smallpox.	Malaria.	Dengue.	Sandfly fever.	Common cold.	Influenza.	Pneumonia, lobar and lobular.	Heat-stroke.	Heat-exhaustion.	All Causes.	Constantly sick.
5·3	..	8·4	..	208·2	..	39·4	8·9	10·5	8·4	..	0·5	601·5	28·75
20·2	..	30·3	..	242·4	..	30·3	..	..	..	..	..	575·8	16·06
...	..	..	..	155·7	..	18·0	..	..	..	..	..	485·0	15·27
8·8	..	11·3	..	93·1	..	10·1	8·8	..	1·3	1·3	2·5	454·1	12·94
13·6	5·7	4·1	..	151·3	..	..	4·2	1·1	5·1	..	..	538·5	23·51
9·7	..	3·3	0·3	100·6	..	..	4·6	5·9	5·6	..	..	354·6	13·87
12·2	..	5·4	..	239·7	..	9·6	5·4	..	3·8	..	1·3	518·9	11·14
11·1	2·4	5·1	0·1	156·6	..	7·0	5·2	3·1	5·2	0·1	0·4	493·3	19·25
9·3	..	7·7	..	53·2	..	..	5·4	..	2·3	..	..	294·8	13·40
10·8	..	8·7	..	82·5	..	7·6	19·5	..	3·7	..	..	351·2	17·87
10·4	..	8·5	..	75·8	..	5·8	16·3	..	3·4	..	..	333·3	16·85
5·5	..	4·6	..	168·1	..	1·4	3·7	..	1·8	..	..	416·2	12·32
26·4	..	..	..	60·4	..	3·8	3·8	..	..	..	..	335·8	7·81
5·0	..	4·0	..	77·3	..	10·9	15·9	..	3·0	..	..	278·5	7·45
7·0	..	4·1	..	133·2	..	3·4	7·3	..	2·0	..	..	369·6	10·55
1·7	..	11·9	..	64·4	..	..	23·7	..	3·4	..	..	231·5	9·56
6·2	..	3·1	..	37·5	..	10·0	20·6	0·6	2·5	..	0·6	306·1	11·01
5·0	..	5·5	..	44·7	..	7·3	21·5	0·5	2·7	..	0·5	302·1	10·62
3·2	..	5·6	..	67·7	..	..	31·4	0·8	5·6	..	..	350·5	15·93
10·6	..	16·9	0·3	125·9	..	..	26·3	4·8	4·5	..	0·3	569·4	25·70
0·4	..	5·8	..	210·8	..	10·7	35·7	..	1·8	..	..	667·7	20·66
33·2	..	5·0	..	111·7	..	..	63·4	..	6·5	..	..	562·9	20·15
7·2	..	7·2	..	64·5	..	..	12·2	..	3·8	..	..	284·6	13·73
..	..	..	..	144·7	..	..	..	..	..	..	..	789·5	22·76
14·1	..	2·9	..	94·2	..	..	12·6	..	4·4	..	..	463·9	13·74
11·4	..	8·2	0·1	116·9	..	1·8	29·1	1·3	4·3	..	0·1	499·4	18·10
7·0	..	8·4	1·4	139 9	..	..	11·2	1·4	2·8	..	..	443·4	19·47
4·4	..	5·8	..	50·9	..	4·4	..	..	1·5	..	..	302·3	11·38
19 0	..	28·6	..	19·0	..	19·0	57·1	..	9·5	..	..	638·1	26·76
..	..	13·9	13·9	13·9	..	..	27·8	..	..	..	..	194·4	7·36
14·1	..	2·8	1·4	74.8	..	..	12·7	..	5·6	..	..	376·6	11·86
1·5	..	12·3	..	27·7	..	15·4	7·7	..	4·6	..	..	246·5	10·34
..	..	29·9	..	371·3	..	..	6·0	..	12·0	..	..	653·7	22·10
13·1	..	11·6	0·5	35·2	1·5	1·0	12·1	..	5·0	..	..	459·1	24·61
9·2	..	10·2	0·8	66·9	0·6	8·3	10·8	0·2	4·5	..	..	403·6	18·23
1·3	..	24·9	..	55·9	..	..	59·9	..	16·0	..	..	677·8	36·55
5·4	..	16·2	2·7	53.9	..	..	16·2	..	2·7	..	..	423·2	13·07
4·6	..	4.6	..	151·4	..	..	41·3	..	..	..	..	449·5	13·67
..	..	11·4	..	20·5	..	..	6·8	15·9	4·6	..	..	154·9	6·38
..	..	..	..	62·5	..	..	..	..	..	..	..	375·0	22·50
..	..	10·8	..	..	..	..	80·9	..	10·8	..	..	247·4	8·45
..	..	..	..	44·1	..	..	..	..	..	..	..	264·7	8·53
..	..	24·0	..	124·7	..	..	19·2	..	4·8	..	..	350·1	8·49
..	..	23·6	..	55·1	..	..	..	..	15·7	..	..	635·0	17·72
9 5	..	5·0	..	111·3	..	..	16·7	..	8·3	..	..	357·3	14·94
4·9	..	12·0	0·2	85·3	..	..	24·2	1·6	8·1	..	..	408·0	16·85

TABLE

Stations and Districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para A.	Para B.	Para C.	Enteric group.	Bacillary.	Bacillary exudate.	Protozoal.	Clinical.
Agra	..	..	..	..	1·5	9·1	4·6	..	3·0
Delhi	..	..	..	..	0·6	4·4	3·8	..	4·4
Muttra	..	1·4	..	..	..	21·2	..	..	..
Total Delhi Bde. Area	..	0·3	..	..	0·7	9·5	3·1	..	3·1
Aurangabad	1·0	..	..	..	..	1·0	..	..	9·9
Ahmednagar	..	..	..	..	..	6·5	6·5	..	8·4
Jubbulpore	..	..	..	..	..	13·7	7·3	..	4·4
Kamptee	..	..	..	..	..	4·1	..	..	8·2
Secunderabad	..	0·4	..	..	..	20·0	0·8	0·4	3·0
Pachmarhi	..	..	..	..	..	5·8	5·8	..	2·9
Saugor	..	..	..	..	..	..	5·3	..	..
Total Deccan District	0·1	0·1	..	..	..	11·9	3·5	0·1	5·3
Mhow	1·3	..	..	..	..	15·7	5·2	..	3·9
Mt. Abu	..	..	..	..	..	52·6	..	..	..
Nasirabad	1·3	..	..	..	..	..	2·7	2·7	..
Baroda	..	..	..	..	..	4·1	2·0	..	..
Ahmedabad	..	..	..	..	1·9	7·5	9·4	..	..
Colaba	..	..	..	..	..	13·6	..	..	..
Deolali	..	..	..	..	3·2	3·2	..	..	..
Total Bombay District	0·6	..	..	..	0·6	8·0	3·6	0·6	0·9
Belgaum	..	..	..	..	..	2·4	1·6	..	..
Poona	0·3	0·3	..	..	0·8	23·0	2·5	0·3	2·2
Total Poona Bde. Area	0·2	0·2	..	..	0·6	17·8	2·2	0·2	1·6
Bangalore	0·7	..	..	..	0·4	5·5	1·1	5·5	1·8
Madras	..	..	..	..	..	3·9	..	2·0	3·9
Cannanore	..	..	..	..	..	1·9	7·7	..	5·8
Wellington	..	..	..	..	..	..	..	..	..
Trichinopoly	..	..	..	..	..	..	..	..	..
Total Madras District	0·5	..	..	..	0·3	4·7	1·8	4·1	2·6
India	0·3	0·1	0·0	0·0	0·3	10·6	2·2	0·8	8·7

XXI—*concld.*

Diarrhœa.	Cholera.	Venereal diseases.	Smallpox.	Malaria.	Dengue.	Sandfly fever.	Common Cold.	Influenza.	Pneumonia, lobar and lobular.	Heat-stroke.	Heat-exhaustion.	All Causes.	Constantly sick.
10·1	..	3·0	..	39·5	..	21·2	7·6	3·0	..	..	..	224·6	7·56
1·4	..	6·3	0·6	38·6	..	..	1·9	4·4	10·1	..	..	292·5	9·87
..	..	5·7	1·4	25·5	..	2·8	11·3	..	7·1	..	..	298·9	10·16
5·8	..	5·4	0·7	35·7	..	5·4	5·4	3·1	7·1	..	..	273·4	9·42
2·0	..	2·0	1·0	88·8	..	..	2·8	1·0	..	..	..	381·0	12·82
2·8	..	13·1	..	29·9	..	0·9	..	..	2·8	..	..	311·2	10·77
3·9	..	12·2	..	142·0	..	..	..	3·4	3·4	..	..	558·0	20·56
..	..	10·2	..	100·2	..	..	20·4	..	18·4	..	..	407·0	14·46
8·7	..	8·7	..	19·6	..	..	1·1	11·0	0·8	..	..	368·3	13·25
2·9	..	8·7	..	151·2	..	..	..	..	..	..	..	282·0	5·87
10·5	..	15·8	..	31·6	..	..	..	5·3	5·3	..	..	231·6	6·32
5·0	..	9·6	0·1	73·3	..	0·1	1·9	4·9	2·8	..	..	407·3	14·35
..	..	3·9	..	210·2	..	1·3	2·6	1·3	6·5	..	..	409·0	14·79
..	..	..	..	157·9	..	..	..	..	..	..	..	368·4	6·32
5·4	..	..	..	53·8	..	..	1·3	5·4	6·7	..	..	260·8	13·35
2·0	..	16·1	..	239·4	..	..	22·6	10·1	..	..	..	497·0	14·24
1·9	..	1·9	1·9	164·2	1·9	9·4	..	7·5	9·4	..	..	384·9	12·06
1·9	..	15·6	..	13·6	..	..	97·3	15·6	..	..	..	441·6	20·49
..	..	6·5	..	48·5	..	..	..	..	..	..	..	346·3	12·17
2·1	..	5·6	0·3	127·7	0·3	1·8	19·3	6·5	4·7	..	..	405·0	14·54
4·0	..	8·0	..	37·6	..	..	32·0	..	1·6	..	..	381·3	11·05
4·1	..	14·0	0·3	127·9	..	..	1·6	43·0	1·9	..	..	472·3	15·52
4·1	..	12·4	0·2	104·9	..	..	9·4	32·0	1·8	..	..	449·1	14·38
6·9	..	22·2	..	22·2	10·0	..	10·3	0·7	3·3	..	0·4	363·4	18·75
3·9	..	13·8	..	17·7	170·9	..	..	5·9	5·9	..	..	546·2	20·75
..	..	1·9	..	40·3	..	..	7·7	1·9	7·7	..	..	312·9	9·81
..	..	..	..	..	..	..	..	..	..	..	..	205·9	15·00
..	..	10·9	..	21·7	10·9	..	10·9	..	..	..	..	369·6	9·57
6·7	..	17·9	..	23·8	29·8	..	8·5	1·6	4·1	..	0·3	379·4	17·55
7·5	0·4	7·5	0·2	199·7	1·1	4·6	11·4	4·4	5·0	0·0	0·2	421·8	15·7

TABLE XXII.

BRITISH OFFICERS OF THE INDIAN ARMY.

Table showing ratios per 1,000 of the strength, of admissions, deaths, invalids and constantly sick, during the year 1938.

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Specific Diseases due to infection or infestation.				
Common cold	8·0	...	...	0·12
Diphtheria	0·5	...	...	0·03
Dysentery	29·3	...	...	1·01
Enteric fevers (inclusive of typhoid, Para A, B & C and enteric group).	4·3	...	...	0·45
Erysipelas	...	...	...	...
Influenza	7·6	...	...	0·15
Malaria	41·1	...	...	1·15
Measles	0·9	...	...	0·02
Meningococcal infection	0·5	0·47	...	0·01
Mumps	1·4	...	...	0·06
Pneumonia	4·7	0·95	...	0·46
Pyrexia of uncertain origin	0·5	...	...	0·01
Rheumatic fever	1·9	...	...	0·11
Sandfly fever	19·4	...	...	0·26
Scarlet fever	0·5	...	...	0·04
Smallpox	0·5	...	...	0·01
Tuberculosis — Pulmonary	...	...	...	...
Tuberculosis — Other	...	...	...	...
Venereal diseases — Gonorrhœa	1·4	...	...	0·21
Venereal diseases — Soft chancre	...	...	...	...
Venereal diseases — Syphilis	...	...	...	...
Venereal diseases — Other V. D.	...	...	...	...
Other diseases due to infection	12·8	0·47	...	0·51
Diseases due to infestation by metazoan parasites — Scabies	...	...	...	...
Diseases due to infestation by metazoan parasites — Other diseases	2·4	0·47	...	0·13
Other diseases classified under systems.				
Diseases of the nervous system	9·0	...	...	0·31
Mental diseases	0·5	...	...	0·07
Diseases of the eye	3·3	...	...	0·09
Diseases of the ear and nose	12·3	...	...	0·26
Diseases of the circulatory system — Valvular diseases of the heart	...	...	...	...
Diseases of the circulatory system — Disordered action of the heart	1·9	...	...	0·08
Diseases of the circulatory system — Other diseases	4·3	0·47	...	0·24
Diseases of the blood and blood forming organs	2·8	0·47	...	0·17
Diseases of ductless or endocrine glands	0·9	...	...	0·07
Diseases of the breast	...	...	...	...
Diseases of the respiratory system — Larynx and trachea	1·4	...	...	0·01
Diseases of the respiratory system — Bronchi & bronchioles	14·2	...	...	0·40
Diseases of the respiratory system — Other diseases	1·4	...	...	0·16
Diseases of the teeth and gums	7·1	...	...	0·14
Diseases of the digestive system — Inflammation of tonsils	15·1	...	...	0·24
Diseases of the digestive system — Inflammation of pharynx	6·1	...	...	0·08
Diseases of the digestive system — Inflammation of stomach	7·6	...	...	0·29
Diseases of the digestive system — Gastric ulcer	0·5	0·47	...	0·01
Diseases of the digestive system — Duodenal ulcer	1·4	...	...	0·24
Diseases of the digestive system — Liver diseases	5·7	...	...	0·37
Diseases of the digestive system — Other diseases	47·3	0·47	...	1·89

TABLE XXII—*contd.*

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Diseases due to disorders of nutrition or of metabolism	...	...	...	...
Diseases of the generative system	0·9	...	...	0·06
Diseases of bones, joints, and muscles, etc.	12·8	...	...	0·45
Diseases of the areolar tissue	19·4	...	0·47	0·76
Diseases of the skin	7·1	...	...	0·23
Diseases of the urinary system	8·5	0·95	...	0·50
Injuries — General	1·9	...	...	0·02
Injuries — Local	47·8	4·73	0·95	1·62
Injuries — In action	...	0·47	...	...
Tumours and cysts	1·4	...	...	0·09
Poisons	0·5	...	...	0·00
No appreciable disease	0·1	...	...	0·11
*Suicides	...	0·95	...	...
Total	386·8	10·40	1·42	13·07

* The figures against "Suicides" having already been shown under the heading of the injury, etc., which caused death are not included in the total.

TABLE XXIII.

INDIAN OFFICERS AND INDIAN OTHER RANKS.

Table showing admission and death ratios per 1,000 of the strength by Commands contrasted with the previous years, and the average for the previous five years.

Commands.		Enteric group of fevers.		Influenza.		Cholera.		Smallpox.		Malaria.		Dysentery.	
		A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
Northern Command	1933-37	1·4	0·12	8·1	0·01	0·00	...	0·2	0·01	172·2	0·06	12·0	0·03
	1937	1·0	0·09	5·0	...	0·00	...	0·2	...	103·5	0·02	11·2	0·02
	1938	0·8	0·09	4·2	...	0·8	0·07	0·2	...	132·8	0·05	16·9	0·04
Western Command	1933-37	1·5	0·09	4·7	0·02	...	...	0·2	....	192·4	0·09	15·8	0·06
	1937	0·7	0·09	1·4	...	...	...	...	...	161·9	0·09	10·5	0·17
	1938	1·1	...	0·1	...	...	...	...	...	87·2	0·09	18·8	...
Eastern Command	1933-37	1·4	0·09	6·7	0·01	0·03	0·01	0·3	0·01	100·3	0·08	11·8	0·03
	1937	0·9	0·17	4·5	...	0·0	...	0·2	...	82·3	0·08	11·6	...
	1938	0·5	0·12	1·8	...	...	...	0·3	0·04	92·3	0·08	16·5	0·04
Southern Command	1933-37	1·3	0·15	9·2	...	...	...	0·2	0·03	82·5	0·01	14·9	0·03
	1937	0·7	...	11·5	...	...	...	0·2	...	66·6	...	17·2	0·05
	1938	0·7	...	11·2	...	...	...	0·2	...	80·7	...	18·3	...
All-India	1933-37	1·4	0·11	8·1	0·01	0·01	0·00	0·1	0·01	144·6	0·06	14·7	0·03
	1937	0·9	0·09	5·7	...	0·0	...	0·2	...	97·9	0·04	12·4	0·04
	1938	0·8	0·07	4·4	...	0·4	0·04	0·2	0·01	109·7	0·06	17·2	0·03

Commands.		Pyrexia of uncertain origin.		Pneumonia, lobar and lobular.		Venereal diseases.		Dengue.		Sandfly fever.			
		A.	D.	A.	D.	A.	D.	A.	D.	A.	D.		D.
Northern Command	1933-37	0·1	0·00	6·5	0·67	7·2	0·01	0·01	...	15·0		...	0·00
	1937	0·1	...	6·0	0·34	5·8	0·02	...	...	9·8		...	...
	1938	0·0	...	6·0	0·63	5·6	...	...	...	7·0	...	...	...
Western Command	1933-37	0·08	...	4·7	0·58	5·1	...	0·03	...	5·8			
	1937	...	...	3·0	0·09	4·9	...	...	...	9·4	...	...	...
	1938	...	...	2·8	0·27	6·5	...	...	...	5·7	...	...	...
Eastern Command	1933-37	0·1	...	5·8	0·48	13·2	...	14·3	...	2·7	...	...	...
	1937	...	...	6·7	0·55	14·5	...	6·6	...	1·9	...	...	...
	1938	0·0	...	5·3	0·23	9·0	...	0·1	...	2·2	...	...	...
Southern Command	1933-37	0·2	0·02	3·3	0·34	10·8	0·01	6·4	...	1·9	...	0·07	0·05
	1937	0·3	...	3·0	0·25	11·4	...	5·5	...	0·5	...	...	...
	1938	0·1	...	3·2	0·20	11·3	...	5·8	...	0·4	...	...	...
All-India	1933-37	0·1	0·01	5·5	0·56	9·8	0·01	3·0	...	8·7	...	0·01	0·01
	1937	0·1	...	5·2	0·34	8·1	0·01	5·1	...	6·0	...	...	...
	1938	0·0	...	5·0	0·43	7·5	0·00	1	...	4·0	...	...	...

A—Admission.
D—Death.

TABLE XXIV.

DETAIL OF DISEASES,

Diseases.	European Army of India.										Indian Army.					
	British officers attached to European troops.			Men.				Women.		Children.		British officers attached to Indian troops.			Men present.			
	A.	D.	Invalids.	A.	Average constantly sick.	D.	Invalids.	A.	D.	A.	D.	A.	D.	Invalids.	A.	D.	Invalids.	Average constantly sick.
Diseases caused by infection or infestation.																		
Anthrax	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blackwater fever	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chickenpox	5	..	..	5	0·23	..	..	1	..	4	..	4	..	..	106	..	..	1·00
Common cold	16	..	..	508	10·20	..	..	28	..	58	..	17	..	..	1,305	..	..	23·42
Cholera	..	..	..	1	0·04	..	..	..	..	..	..	..	..	..	42	4	..	3·15
Cowpox	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dengue	2	..	..	166	3·88	..	..	8	..	5	..	2	..	..	119	..	..	2·54
Diphtheria	3	..	..	53	6·20	1	..	8	..	64	2	1	..	..	6	..	..	0·42
Dysentery—																		
(*a*) Protozoal	21	..	..	147	11·57	..	1	6	..	3	..	13	..	..	88	1	..	6·26
(*b*) Bacillary	34	..	..	592	27·16	2	2	43	..	147	3	28	..	..	1,183	..	..	43·30
(*c*) Bacillary exudate	6	..	..	201	7·52	..	..	14	..	37	1	9	..	..	248	..	..	8·99
(*d*) Clinical	9	..	..	214	8·06	..	..	14	..	32	..	12	..	..	412	2	..	13·76
Encephalitis (lethargica)	..	..	..	2	0·73	..	..	..	..	..	..	..	..	..	..	..	..	..
Enteric fevers—																		
(*a*) Typhoid fever	..	..	..	15	2·55	3	1	2	..	2	..	2	..	..	38	5	..	6·06
(*b*) Paratyphoid A.	1	..	..	2	0·28	..	..	..	..	2	..	4	..	..	15	..	..	2·35
(*c*) Paratyphoid B.	..	..	..	4	0·52	..	..	..	..	..	..	..	..	..	1	..	..	0·39
(*d*) Paratyphoid C.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	0·16
(*e*) Enteric group	4	..	..	16	2·23	2	..	1	..	2	..	3	..	..	31	3	..	4·11
Enteritis infective, (including food poisoning)	1	..	..	3	0·09	..	..	..	..	5	1	..	..	..	2	..	..	0·04
Erysipelas	..	..	..	2	0·04	..	..	1	..	..	..	..	..	..	2	..	..	0·10
Gangrene, acute infective	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1·05
Hydrophobia (Rabies)	..	..	..	3	0·02	3	..	..	..	..	..	..	..	..	2	2	..	0·01
Influenza	23	..	..	570	15·80	..	..	16	..	30	..	16	..	..	488	..	..	11·80
Jaundice epidemic catarrhal	48	..	..	256	14·16	..	..	..	..	6	..	17	..	..	185	1	..	11·61

Jaundice spirochætal	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Leishmaniasis—																			
(*a*) Kala-azar	..	..	..	1	0·52	..	2	1	..	..	..	..	..	..	..	32	2	2	4·41
(*b*) Oriental sore	..	..	..	8	0·52	..	..	2	..	..	..	1	..	..	..	95	..	..	5·46
Leprosy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	3	0·40
Malaria	78	..	..	2,170	92·46	3	..	78	..	70	..	87	..	..	12,294	6	5	310·11	
Measles	..	..	..	16	1·44	..	..	..	..	42	2	2	..	..	194	..	..	10·47	
Meningococcal infection (cerebro-spinal fever)	..	..	..	2	0·09	1	..	..	..	1	..	1	1	..	23	8	1	2·48	
Mumps	..	..	..	18	0·99	..	..	..	..	..	..	3	..	..	527	1	..	27·33	
Plague	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Pyæmia	..	..	..	1	0·26	..	1	..	..	..	..	..	..	..	3	..	..	0·63	
Pyrexia of uncertain origin	2	1	..	9	0·68	..	..	..	..	1	..	1	..	..	4	..	..	0·29	
Relapsing fever	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	0·22	
Rheumatic fever	2	..	..	53	6·31	..	9	8	..	5	..	4	..	..	75	..	3	6·10	
Rubella (German measles)	..	..	..	54	1·99	..	..	..	..	1	..	1	..	..	1	..	..	0·02	
Sandfly fever	46	..	..	1,067	20·17	..	..	15	..	6	..	41	..	..	517	..	..	10·92	
Scarlet fever	..	..	..	5	0·51	..	..	1	..	8	..	1	..	..	..	..	..	..	
Septicæmia	1	..	..	7	0·45	5	..	1	..	2	..	..	1	..	6	3	..	0·51	
Smallpox	..	..	..	5	0·41	..	..	..	..	6	..	1	..	..	22	1	..	1·57	
Tetanus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Tuberculosis pulmonary	2	..	..	50	13·22	2	51	8	1	1	..	..	..	..	188	14	160	23·67	
Tuberculosis other cases	..	..	..	1	0·35	2	8	1	..	6	..	..	..	..	40	4	20	7·74	
Typhus fever	1	..	..	23	1·58	1	..	..	..	1	..	..	..	..	38	..	1	3·86	
Undulent fever	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	..	..	2·58	
Venereal diseases—																			
(*a*) Gonorrhœa	..	..	..	1,208	134·84	..	2	..	..	..	..	3	..	..	322	..	2	33·12	
(*b*) Soft chancre	..	..	..	340	31·49	..	..	..	..	..	..	..	..	..	170	..	..	15·26	
(*c*) Syphilis	..	..	..	328	28·82	..	2	..	..	..	..	..	..	..	344	..	4	30·52	
(*d*) Other cases	..	..	..	65	3·51	..	..	..	..	..	..	..	..	..	1	..	..	0·04	
Whooping-cough	..	..	..	..	..	..	..	..	..	14	2	..	..	..	..	..	..	..	
Other diseases caused by infection	3	1	..	8	0·77	..	1	..	..	3	..	2	..	..	12	..	..	1·44	
Diseases due to infestation by metazoan parasites.																			
Ankylostomiasis	1	..	..	18	1·20	..	..	1	..	..	..	1	..	..	483	..	..	23·69	
Ascariasis	1	..	..	6	0·12	..	..	..	..	7	..	..	..	..	96	..	..	2·54	
Bilharziasis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Dracontiasis (Guinea-worm)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	206		1	12·80	
Intestinal tæniasis—																			
(*a*) Tænia Solium	..	..	..	4	0·09	..	..	..	..	6	..	1	..	..	7	..	..	0·26	
(*b*) Tænia Saginata	5	..	..	121	2·43	..	..	6	..	20	..	2	..	..	29	..	..	1·12	
Other intestinal parasites	..	..	..	1	0·17	..	2	1	..	1	..	1	1	..	6	..	..	0·17	
Pediculosis	..	..	..	2	0·02	..	..	..	..	..	..	..	..	..	2	..	..	0·06	
Scabies	1	..	..	82	2·43	..	..	..	..	1	..	..	..	..	1,253	..	..	40·86	
Other diseases due to infestation	..	..	..	9	0·81	..	..	1	..	1	..	..	..	..	10	..	1	0·33	

A.—Admissions. D.—Deaths.

TABLE XXIV—*contd.*

Diseases.	European Army of India.										Indian Army.					
	British officers attached to European troops. 2,055			Men. 47,388				Women. 4,148		Children. 6,157	British officers attached to Indian troops. 1,841			Men present. 98,901			
	A.	D.	Invalids.	A.	Average constantly sick.	D.	Invalids.	A.	D.	A.	D.	A.	D.	Invalids.	A.	D.	Invalids.	Average constantly sick.
Diseases of the nervous system.																		
Aphasia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cerebral hæmorrhage	...	...	...	1	0·01	2	...	...	...	...	...	...	...	...	1	1	...	0·01
Chorea	...	...	...	2	0·54	...	1	...	...	4	...	...	...	...	...	...	...	...
Convulsions	...	...	...	5	0·29	...	1	1	...	9	1	...	...	...	2	...	...	0·13
Diseases of the spinal cord	...	...	...	11	1·59	3	4	...	...	6	...	...	...	...	8	...	3	0·95
Epilepsy	...	...	...	13	2·01	...	11	4	...	...	...	...	...	...	29	...	23	2·68
Vertigo	1	...	...	32	0·93	...	...	1	...	...	...	...	...	...	22	...	...	0·69
Meningitis	...	...	...	4	0·17	1	...	...	...	1	...	...	...	...	8	3	1	0·56
Headache	9	...	...	208	4·33	...	...	4	...	1	...	6	...	...	31	...	...	0·69
Neuralgia	...	...	...	13	0·30	...	...	1	...	...	...	...	...	...	26	...	...	0·70
Neuritis	...	...	...	16	1·54	...	1	...	...	...	...	2	...	...	46	...	4	3·79
Paralysis	...	...	...	13	1·50	...	4	2	...	...	...	...	...	...	37	...	2	2·80
Sciatica	...	...	...	30	2·95	...	1	2	...	...	...	2	...	...	138	...	5	5·81
Other diseases of the nervous system	3	...	...	47	2·25	2	4	4	3	2	...	9	...	...	46	3	4	2·52
Mental diseases.																		
Feeblemindedness	...	...	...	8	3·36	..	9	...	...	...	...	...	...	...	2	...	...	0·41
Hysteria	1	...	...	26	3·81	...	15	7	...	1	...	...	...	...	31	...	8	2·58
Involution (melancholia)	...	...	...	...	0·10	...	...	...	...	...	...	...	...	...	1	...	1	0·03
Mania	...	...	...	7	1·88	...	3	...	...	...	...	...	...	...	8	...	9	0·93
Mental deficiency	...	...	...	3	0·97	...	3	...	...	2	...	...	...	...	1	...	1	0·10
Neurasthenia	2	...	...	15	2·50	...	4	7	...	...	...	...	...	...	30	...	6	2·20
Schizophrenia (dementia præcox)	...	...	...	11	6·69	...	18	2	...	...	...	...	...	...	12	...	11	1·82
Other mental diseases	1	...	...	39	5·74	1	13	4	...	...	...	1	...	...	20	...	5	1·58
Diseases of the eye.																		
Amblyopia and amaurosis	...	...	...	1	0·02	...	1	...	...	...	...	...	...	...	...	...	2	...
Anomalies of refraction	...	...	...	14	0·42	...	4	...	...	...	...	...	...	...	12	...	9	0·70
Blepharitis	...	...	...	10	0·53	...	1	...	...	1	...	...	...	...	4	...	1	0·05
Conjunctivitis	1	...	...	75	2·79	...	2	2	...	11	...	...	...	...	713	...	...	20·63
Conjunctivitis granular (Trachoma)	...	...	...	1	0·06	...	...	...	...	...	...	2	...	...	207	...	7	10·67
Cataract	...	...	...	...	...	...	...	1	...	...	...	...	...	...	4	...	2	0·35
Glaucoma	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	0·07

Iritis	...	...		5	0·20	...	...	1	...	...	...	1	...	...	9	...	...	0·67
Keratitis	...	...	...	18	1·53	...	2	...	...	...	...	1	...	...	164	...	6	10·81
Retinitis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	3	0·48
Other diseases of the eye	...	...	...	23	1·85	...	2	1	...	1	...	3	...	...	170	...	24	8·48
Diseases of the ear.																			
Inflammation of the external ear	3	...	...	210	5·11	...	...	2	...	11	...	2	...	...	138	...	...	2·87
Diseases of the middle ear	4	...	...	125	6·04	...	3	8	...	30	...	2	...	...	339	1	6	14·38
Furunculosis	6	...	...	132	3·44	...	...	...	...	1	...	2	...	...	62	...	...	1·33
Diseases of the mastoid process	1	...	...	15	1·47	1	1	1	...	13	...	1	...	...	13	...	2	1·61
Other diseases of the ear	...	...	...	1	0·16	...	...	...	...	...	...	...	...	...	6	...	1	0·42
Diseases of the nose.																			
Diseases of the mucous membrane	14	...	...	327	6·57	...	...	5	...	15	...	5	...	...	330	...	...	6·83
Diseases of the bone and cartilage	...	...	...	9	0·32	...	...	...	...	1	...	...	...	...	...	...	1	0·04
Sinusitis	15	...	...	136	4·98	...	...	4	...	3	...	7	...	...	29	...	...	1·58
Other diseases of the nose	10	...	...	113	3·58	...	1	3	...	...	...	7	...	...	8	...	...	0·29
Diseases of the circulatory system.																			
Diseases of the valves	...	...	...	5	0·59	...	6	7	1	1	...	...	...	...	10	...	7	1·09
Disordered action of the heart	5	...	...	81	5·58	1	11	3	...	...	...	2	...	...	45	4	2	2·55
Diseases of blood vessels	1	...	...	71	5·18	1	4	9	...	...	...	7	1	...	40	5	2	2·91
Endocarditis	...	...	...	6	1·79	...	3	...	...	1	...	...	...	...	7	1	3	0·77
Myocarditis	...	...	...	3	0·71	1	...	1	...	...	...	...	...	...	...	1	...	...
Pericarditis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	2	1	0·65
Other diseases of the circulatory system	...	...	...	9	0·78	1	1	...	...	...	...	4	...	...	4	4	...	0·30
Diseases of the blood and blood forming organs.																			
Anæmia primary	...	...	...	6	0·46	...	1	2	...	1	1	1	...	...	6	2	...	0·73
Anæmia pernicious	...	...	...	2	0·20	...	1	...	...	...	...	...	...	...	4	1	...	0·35
Anæmia secondary	...	...	...	10	0·82	...	...	8	...	2	...	...	...	...	247	1	...	14·06
Diseases of the spleen	...	...	...	7	0·22	...	1	...	...	...	...	...	...	...	33	...	...	1·39
Lymphadenitis	6	...	...	196	11·17	...	1	4	...	26	...	4	...	...	161	...	2	9·67
Lymphangitis	...	...	...	8	0·33	...	...	...	...	...	...	...	...	...	8	...	...	0·32
Other blood diseases	...	...	...	22	1·97	...	3	1	...	1	1	1	1	...	16	2	6	1·68

A.—Admissions. D.—Deaths.

TABLE XXIV—*contd.*

Diseases.	European Army of India.										Indian Army.					
	British officers attached to European troops.			Men.			Women.		Children.		British officers attached to Indian troops.			Men present.		
	A.	D.	Invalids.	A.	Average constantly sick.	D.	Invalids.	A.	D.	A.	D.	A.	D.	Invalids.	A.	D.	Invalids.	Average constantly sick.
Diseases of glands of internal secretion.																		
Goitre	...	...	...	4	0·19	...	...	1	...	...	...	2	...	...	11	...	1	0·51
Hyperthyroidism	...	...	...	4	0·91	...	3	3	...	...	...	...	...	...	1	...	2	0·23
Other diseases	...	...	...	2	0·26	...	1	2	1	...	...	...	...	...	4	...	1	0·27
Diseases of the breast.																		
Mastitis	...	...	...	11	0·66	...	...	12	...	...	...	...	...	...	...	...	...	...
Other diseases	...	...	...	...	0·04	...	...	1	...	...	...	...	...	...	...	...	...	0·07
Diseases of the respiratory system.																		
Asthma	5	...	...	39	2·95	...	5	6	1	3	...	...	...	...	65	...	7	3·48
Bronchitis	8	...	...	741	26·97	...	5	30	...	143	...	30	...	...	1,390	...	2	45·95
Empyema	...	...	...	4	0·83	...	6	...	...	1	...	...	...	...	...	...	...	...
Laryngitis	...	...	...	34	1·09	...	...	1	...	4	1	3	...	...	69	...	...	2·25
Pleurisy	1	...	...	61	5·34	...	3	4	...	3	...	3	...	...	255	4	10	23·48
Pneumonia—																		
(*a*) Lobar	9	3	...	108	10·38	10	2	7	2	14	3	9	1	...	446	36	1	36·32
(*b*) Lobular (broncho-pneumonia)	3	...	...	35	2·52	3	...	1	...	30	8	1	1	...	115	12	...	10·14
Other diseases	1	...	...	40	2·79	2	3	3	...	4	2	...	...	...	27	1	...	1·24
Diseases of the teeth and gums.																		
Caries of the enamel, dentine and cementum.	2	...	...	25	0·56	...	...	7	...	10	...	5	...	...	103	...	...	2·27
Gingivitis	1	...	...	24	0·55	...	...	1	...	4	...	1	...	...	129	...	...	2·89
Pyorrhœa alveolaris	1	...	...	36	0·81	...	1	...	...	...	...	3	...	...	81	...	1	2·66
Other diseases	3	...	...	36	1·50	...	...	3	...	11	...	6	...	...	40	...	...	1·00

Diseases of the digestive system.																								
Appendicitis	24	...	...	326	22·40	7	...	30	...	19	...	24	1	...	197	5	2	11·86
Cholecystitis and cholangitis	3	...	...	17	1·56	1	2	4	1	1	...	1	...	...	10	...	...	1·01
Colic	7	...	...	186	3·78	...	...	17	...	9	...	5	...	...	157	...	...	3·23
Colitis	...	...	...	8	0·67	...	2	3	...	1	...	2	...	...	32	...	...	1·32
Constipation	7	...	...	314	5·35	...	...	14	...	66	...	...	...	...	292	...	...	5·11
Diarrhœa	54	...	...	776	18·38	...	...	64	...	163	1	33	...	...	842	...	...	18·37
Enteritis	5	...	...	80	0·92	...	...	4	...	46	10	2	...	...	21	...	...	0·56
Fistula in ano	...	...	...	12	1·28	...	...	...	...	...	...	6	...	...	37	...	...	3·30
Gastritis	11	...	...	361	18·79	1	10	10	...	16	...	16	...	...	125	1	...	5·44
Glossitis	...	...	...	2	0·21	...	1	1	...	...	...	1	...	...	7	...	...	0·34
Hœmorrhoids (piles)	7	...	...	165	7·24	...	...	7	...	...	...	7	...	...	202	...	...	9·67
Hepatitis acute	3	...	...	32	2·95	...	...	2	...	3	...	0	...	...	68	...	...	4·17
Hepatic abscess (Tropical abscess)	...	...	...	3	0·31	...	...	...	...	...	...	...	...	...	1	1	...	0·50
Hepatitis chronic (cirrhosis)	...	...	...	5	0·35	...	1	...	...	...	...	...	...	...	8	2	1	0·81
Hernia	1	...	...	97	7·49	...	3	3	...	7	...	1	...	...	77	...	2	6·17
Hypertrophy of the tonsils	4	...	...	142	4·20	...	...	7	...	148	...	3	...	...	11	...	...	0·94
Indigestion	7	...	...	123	3·58	...	...	20	...	10	...	3	...	...	584	...	...	14·43
Intestinal obstruction	...	...	...	3	0·26	...	...	2	...	...	...	...	...	...	8	4	...	0·30
Inflammation of the palate and pillars of the fauces	...	...	...	3	0·09	...	...	...	...	1	...	...	...	...	2	...	...	0·08
Jaundice	5	...	...	38	2·91	...	...	1	...	1	1	6	...	...	49	1	...	2·89
Pharyngitis	14	...	...	444	9·24	...	...	7	...	13	1	13	...	...	2,163	...	...	43·98
Pertionitis	1	...	...	8	1·24	...	...	1	...	1	...	...	...	...	6	1	...	1·03
Quinsy	10	...	...	104	2·92	...	...	9	...	1	...	1	...	...	45	1	...	1·24
Sprue	1	...	...	13	3·56	...	7	3	1	1	...	...	...	...	8	...	1	1·55
Stomatitis	2	...	...	6	0·30	...	...	1	...	5	...	...	...	...	34	...	...	1·15
Tonsillitis	33	...	...	1,453	33·74	...	...	71	...	192	...	32	...	...	682	...	...	17·23
Other diseases	15	...	...	178	10·64	3	6	17	...	23	...	15	1	...	126	5	2	8·05
Diseases due to disorders of nutrition or of metabolism.																								
Beri-beri	...	...	...	...		...	...	...	...	...	...	...	...	...	2	...	...	0·28
Diabetes mellitus	...	...	...	6	1·08	...	3	1	...	...	...	...	...	...	10	1	4	0·76
Gout	...	...	...	2	0·05	...	...	...	...	...	...	...	...	...	4	...	...	0·25
Inanition	...	...	...	4	0·06	...	...	...	...	30	4	...	...	...	3	...	2	0·10
Rickets	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...
Scurvey	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...
Other diseases	...	...	...	1	0·02	...	...	2	...	7	1	...	...	...	1	...	1	0·25
Diseases of the male organs of generation.																								
Balanitis	...	...	...	100	2·88	...	...	...	...	1	...	...	...	...	9	...	...	0·25
Epididymitis	1	...	...	35	1·94	...	...	...	...	...	...	...	...	...	24	...	...	0·93
Hydrocele	1	...	...	17	0·96	...	...	...	...	1	...	...	...	...	15	...	...	0·98

A.—Admissions. D.—Deaths.

TABLE XXIV—*contd.*

Diseases.	European Army of India.										Indian Army.					
	British Officers attached to European troops.			Men.				Women.		Children.		British officers attached to Indian troops.			Men present.			
	A.	D.	Invalids.	A.	Average constantly sick.	D.	Invalids.	A.	D.	A.	D.	A.	D.	Invalids.	A.	D.	Invalids.	Average constantly sick.
Diseases of the male organs of generation—contd.																		
Hypertrophy of the prostate	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Orchitis	1		...	68	2·83	...	...	...	...	...	...	...	...	...	67	...	2	3·01
Paraphimosis	..	...	...	18	0·89	...	...	...	...	1	...	...	...	...	0	..	...	0·42
Phimosis	...	..	..	119	5·70	...	...	...	...	22	...	...	...	...	24	...	...	1·82
Prostatitis	...	..	...	5	0·36	...	...	...	...	...	...	...	...	...	4	...	...	0·40
Stricture of the urethra	...	..	..	2	0·03	...	...	...	...	...	...	...	...	...	4	...	...	0·84
Urethral fistula	...	..	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Urethritis	...	..	..	183	9·17	...	...	...	...	...	...	...	...	...	74	...	...	3·32
Varicocele	...	..	...	53	2·67	...	...	...	...	1	...	...	...	...	18	...	...	0·79
Other diseases	...	..	...	13	1·12	...	...	...	...	...	...	2	...	...	15	...	1	1·74
Diseases of the female organs of generation.																		
Abortion	...	...	...	...	...	...	...	100	...	...	...	...	...	..	...	...	...	...
Affection connected with pregnancy and parturition and consequent on parturition	...	...	...	...	...	...	...	83	2	...	...	...	...	...	...	...	...	...
Diseases of the ovary	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...
Diseases of the fallopian tube	...	...	..	...	...	...	...	5	...	..	...	...	...	...	...	...	...	...
Displacements and distortions of the uterus	...	...	...	...	...	...	...	17	...	...	...	...	...	...	...	...	...	...
Dysmenorrhœa	...	...	...	...	...	...	...	5	...	...	...		..	...	...	...	...	...
Endometritis	...	...	...	...	...	...	...	17	...	...	...	...	...	...	...	...	...	...
Haemorrhage connected with parturition	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...
Inflammation of vagina	...	..	...	...	...	...	...	1	...	2	...	...	...	...	...	...	...	...
Menorrhaegia	...	...	...	...	...	...	...	15	...	...	...	...	...	...	...	...	...	...
Metrorrhaegia	...	...	...	...	...	...	...	8	...	...	...	...	...	...	...	...	...	...
Pelvic peritonitis	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Other diseases peculiar to women	...	...	...	...	...	...	...	46	1	3	1	...	...	...	...	...	...	...

Diseases affecting child.																					
Asphyxia of child	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	
Injury to child	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	
Premature birth	...	...	...	...	...	...	...	...	...	4	3	...	...	...	...	...	...	...	...	...	
Still-borne	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Diseases of bones, joints, muscles, fascia and bursæ.																					
Arthritis	1	...	...	49	5·26	...	7	2	...	1	...	3	...	...	49	...	4	4·07			
Diseases of the spine	1	...	...	10	1·48	...	5	...	...	1	...	...	...	...	5	...	1	0·31			
Flat foot	...	...	...	7	0·78	...	2	...	...	...	...	...	...	...	...	...	2	...			
Hammer-toe	...	...	...	12	0·74	...	...	...	...	...	...	...	...	...	...	...	...	...			
Lumbago	6	...	...	38	1·18	...	...	2	...	...	...	...	...	...	...	...	...	...			
Myalgia	2	...	...	148	3·73	...	...	4	...	4	...	3	...	...	123	...	...	3·82			
Osteo-myelitis	1	...	...	11	1·80	...	..	1	...	7	...	3	...	...	287	...	...	6·41			
Periostitis	3	...	..	12	0·95	...	...	...	...	...	...	...	...	...	16	...	2	2·40			
Synovitis	7	...	...	406	14·32	...	2	...	...	4	...	...	...	...	48	...	2	2·20			
Other deformities of limbs	...	...	...	19	2·15	...	2	1	...	1	...	5	...	...	336	...	3	15·46			
Other diseases	18	...	...	426	28·68	1	24	12	...	4	...	13	...	...	2	...	2	0·26			
															244	...	22	15·05			
Diseases of the areolar tissue.																					
Boil	8	...	...	333	10·80	...	...	1	...	6	...	6	...	...	660	...	...	20·11			
Carbuncle	2	...	...	19	0·71	1	...	...	...	...	...	3	...	...	23	...	...	0·07			
Cellulitis	60	...	...	1,814	58·81	1	1	28	...	59	...	28	...	1	2,481	1	...	79·93			
Cellulitis suppurative (abscess).	6	...	...	132	4·68	...	...	10	...	9	...	4	...	...	374	1	...	12·64			
Other diseases	1	...	...	14	0·53	...	...	...	...	3	1	...	...	...	31	...	1	1·03			
Diseases of the skin.																					
Acne	...	...	...	17	1·12	...	...	...	...	...	...	...	...	...	16	...	...	0·58			
Dermatitis	1	...	...	176	8·70	...	2	2	...	4	...	3	...	...	425	...	...	17·87			
Eczema	1	...	...	97	6·44	...	2	2	...	4	...	1	...	...	274	...	2	12·82			
Favus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	0·02			
Herpes Zoster	...	...	...	40	1·08	...	...	...	...	...	...	...	...	...	90	...	...	2·87			
Impetigo	5	...	...	544	25·12	...	...	...	...	8	...	2	...	...	110	...	...	4·95			
Ingrowing toe-nail	2	...	...	112	4·11	...	...	...	...	1	...	2	...	...	6	...	...	0·25			
Onychia	...	...	...	11	0·27	...	...	...	...	1	...	...	...	...	1	...	...	0·02			
Prickly heat	1	...	...	85	1·13	...	...	...	...	1	...	...	...	...	10	...	...	0·18			
Psoriasis	1	...	...	25	1·29	...	...	...	...	1	...	...	...	...	25	...	...	1·89			
Sycosis (folliculitis)	...	...	...	38	2·73	...	3	...	...	...	...	...	...	...	32	...	1	1·69			
Tinea	3	...	.	506	14·94	...	3	...	...	12	...	1	...	...	542	...	1	18·04			
Urticaria	3	...	...	49	1·38	...	1	3	...	2	...	1	...	...	90	...	...	2·23			
Wart	1	...	...	44	2·99	...	...	...	...	...	...	...	...	...	14	...	...	0·71			
Whitlow	...	...	..	30	1·01	...	...	...	...	2	...	...	...	...	112	...	...	4 15			
Other diseases	2	...	...	147	7·56	...	2	4	...	...	...	2	...	...	73	...	...	5·00			

A.—Admissions. D.—Deaths.

TABLE XXIV—*concld.*

Diseases.	European Army of India.										Indian Army.					
	British Officers attached to European troops.			Men.			Women.		Children.		British Officers attached to Indian troops.			Men present.			
	A.	D.	Invalids.	A.	Constantly sick.	D.	Invalids.	A.	D.	A.	D.	A.	D.	Invalids.	A.	D.	Invalids.	Average constantly sick.
Diseases of the urinary organs.																		
Calculus—																		
(*a*) Bladder	...	...	...	1	0·07	...	...	...	...	...	...	...	...	...	9	...	...	0·63
(*b*) Kidney	1	...	...	2	0·21	...	1	1	...	...	...	1	...	...	16	...	...	1·13
(*c*) Ureter	...	...	...	10	1·08	...	...	...	...	...	...	...	...	...	28	...	2	1·80
Cystitis	4	...	...	45	2·34	...	...	10	...	1	...	3	...	...	19	...	...	1·32
Haematuria	...	...	...	31	1·81	...	1	...	...	...	...	2	...	...	16	...	...	0·97
Incontinence of urine	...	...	...	11	0·85	...	2	...	...	2	...	...	...	...	1	...	...	0·02
Nephritis acute	1	1	...	6	0·87	...	2	1	...	1	...	2	1	...	17	3	4	1·78
Nephritis chronic	...	...	...	...	...	...	...	2	...	...	...	...	...	...	3	...	2	0·55
Renal colic	3	...	...	31	1·18	...	2	5	...	...	...	3	...	...	138	...	...	4·26
Other diseases	2	1	...	112	7·84	1	3	12	...	26	...	7	1	...	108	2	3	6·88
General injuries.																		
Burns and scalds	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Effects of anti-rabic treatment.	...	...	...	2	0·05	...	...	...	...	...	...	...	...	...	...	...	...	...
Effects of inoculation	...	...	...	22	0·35	...	...	...	...	...	...	1	...	...	5	...	...	0·06
Heat-exhaustion	4	...	..	65	1·70	6	...	...	...	...	...	2	...	...	22	...	...	0·33
Heat-stroke	...	...	...	22	0·78	0	1	...	...	6	2	...	...	...	3	1	...	0·09
Sun-stroke	...	...	...	1	0·01	...	...	...	...	...	...	...	...	...	...	...	...	...
Other injuries	5	1	...	34	1·23	9	1	...	...	2	1	1	...	...	17	8	1	0·40
Local injuries.																		
Abrasions	5	...	...	142	4·09	...	...	1	...	1	...	8	...	...	246	...	...	6·74
Burns and scalds	1	...	...	79	2·69	...	2	1	...	4	...	...	...	...	184	1	2	8·66
Concussions	14	...	...	118	6·43	2	2	1	...	7	...	8	...	...	82	1	5	4·05

Contusions	20	...	...	525	14·19	1	1	3	...	7	...	23	...	...	2,066	4	12	·66
Dislocations and displacements.	...	...	...	41	1·45	...	4	...	..	...	...	...	...	...	71	...	9	4·49
Fractures	29	2	...	594	42·74	11	12	5	...	37	...	24	4	1	1,261	10	61	101·45
Sprains and strains	14	...	...	782	23·25	...	...	3	...	5	...	21	...	...	901	...	...	26·02
Wounds gun-shot	1	1	...	38	4·27	7	12	...	1	1	...	6	6	...	234	35	65	25·06
Wounds others	11	1	...	265	8·91	...	3	1	...	21	...	8	...	1	1,584	1	7	59·47
Injuries self-inflicted	...	...	...	5	0·77	2	2	...	...	...	...	...	...	...	1	2	...	0·04
Other injuries	8	...	...	111	5·93	2	4	1	...	1	...	2	1	...	71	6	7	4·17
Tumours and cysts.																		
Carcinoma	1	...	...	2	0·24	1	...	7	1	...	...	...	...	...	3	2	2	20·42
Cysts	...	...	...	68	2·12	...	1	2	...	1	...	2	...	...	89	...	...	2 86
Sarcoma	...	...	...	4	0·48	...	2	1	...	...	...	...	...	...	7	...	5	0·93
New growths malignant (other cases).	...	...	...	22	1·68	1	2	7	...	...	...	1	...	...	11	1	1	0·73
New growths non-malignant	2	...	...	29	1·58	...	...	2	...	2	...	...	...	...	41	...	3	2·22
Malformations	1	...	...	14	1·01	...	...	1	...	4	2	...	...	...	5	...	2	0·54
Poisons.																		
Alcohol	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Arsenic	...	...	...	...	...	...	...	..	...	...	...	...	...	...	1	1	...	0·00
Chloroform	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other chemical poisons	2	0·04	2	...	...	...	...	...	...	...	...	...	...	...	1	3	...	0·02
Opium	1	0·18	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	0·01
Venom of insects	2	0·02	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	0·12
Venom of Ophidia (snake bite).	4	0·08	...	...	...	...	...	...	...	...	...	...	...	...	9	1	...	0 40
Other poisons	2	0·04	...	...	...	...	...	...	...	1	...	...	4	...	...	0·06
No appreciable disease	5	...	...	131	4·73	...	...	22	...	10	...	10	...	...	88	...	...	3·17
All other causes	...	...	...	7	0·41	...	...	...	...	9	...	3	...	...	7	...	...	0·34

A.—Admissions. D. Deaths.

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PRINTED BY THE MANAGER, GOVERNMENT OF INDIA PRESS, NEW DELHI
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BRAN
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ARMY HEADQUARTERS, INDIA,

MEDICAL DIRECTORATE;

Simla, 20th August 1940.

SIR,

I have the honour to submit the accompanying report on the Health of the Army in India for the year 1939.

The year has been marked by the outbreak of the War against Germany on the 3rd of September, a factor which has had a considerable effect on the general health of the Army in India.

This report deals with the year as a whole but the statistical portions contained in Part II of the Report have been divided into three periods—the peace-period of 8 months, the war-period of 4 months and the whole year period. These statistics are being presented as in the previous volume as appendices. As, however, the preparation of the statistical portions takes a very considerable time with delay in the publication of, and consequent loss of interest in the report, in the present volume this statistical portion is being prepared as a separate part, Part II, for subsequent publication, when ready. It is hoped by this means to place the information contained in the report at the disposal of those concerned within a more reasonable time than has been possible in the past. Even now unexpected delays have prevented the publication of Part I as early as was hoped or expected.

The lay out of this report has been rearranged so that all special subjects are placed together in Section III, allowing thereby general comment on the Army in India as a whole, rather than piece-meal comment in Section I for British and Section II Indian Troops. It is considered that we should view the Army in India as a whole from the professional aspect rather than as two distinctly separate entities.

The health of the Army has been satisfactory and there have been no serious epidemics, although civilian areas amidst which troops are placed suffered extensively from cholera, plague, smallpox, dysentery, malaria and enteric fevers.

For British Troops an admission rate of 666·1 per 1,000 is a considerable increase on the previous year; but the reduction of strength during the year makes this increase more apparent than real. Death rates at 2·75 and Invaliding rates at 9·14 per 1000 are reductions on those of 1938. The last quinquennial period shows a satisfactory fall in sick, death and invaliding rates which has been progressive over the quenquennial periods since the last war.

Indian Troops with an admission rate at 454·0 per 1000 show an increase of 32·2 per 1000 on the previous year and invaliding rates also increased by nearly 1 per 1000 to 6·43; but death rates decreased. The health of Indian Troops can however be considered to be satisfactory and increases can be fully accounted for by the conditions of war service and the return or influx of large numbers of men potentially infected with malaria and other prevalent diseases.

Family welfare work and the medical care of families continues to make remarkable progress wherever and whenever funds permit.

Finally the reports on special subjects indicate clearly the great amount of medical work, preventive and curative which is carried out by the military Medical Services for the Army in India.

I have the honour to be,

Sir,

Your obedient servant,

W. H. HAMILTON,

Major-General,

Director of Medical Services in India.

The Secretary,

Defence Department (Army Branch),

Government of India.

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ABBREVIATIONS.

A.	Admissions.
A. D. H.	Assistant Director of Hygiene.
A. D. M. S.	Assistant Director of Medical Services.
A. D. P.	Assistant Director of Pathology.
Av. c. s.	Average constantly sick.
A. H. Q.	Army Headquarters.
B. M. H.	British Military Hospital.
B. Os.	British Officers.
B. O. Rs.	British Other Ranks.
C.	Cases.
C. M. %	Case mortality per cent.
D.	Deaths.
D. A. D. P.	Deputy Assistant Director of Pathology.
D. A. H.	Disordered action of the heart.
D. D. M. S.	Deputy Director of Medical Services.
D. M. S.	Director of Medical Services.
E. C.	Eastern Command.
Foll.	Followers.
G. S. W.	Gun-shot wound.
I. M. H.	Indian Military Hospital.
I. O. Rs.	Indian Other Ranks.
I. O.	Indian Officer.
M. Os.	Medical Officers.
N. C. Os.	Non-Commissioned Officers.
N.-W. F. P.	North-West Frontier Province.
N. C.	Northern Command.
O. C.	Officer Commanding.
P.	Primary.
P. A.	Per annum.
P. M.	*Per mille.*
P. U. O.	Pyroxia of uncertain origin.
P. & A.	Presidency and Assam District.
R.	Revaccinations.
S. E. M. O.	Senior Executive Medical Officer.
S. C.	Southern Command.
T. A. B.	Typhoid, Paratyphoid A and B.
U. K.	United Kingdom.
U. P.	United Provinces.
V. D.	Venereal diseases.
V. D. H.	Valvular disease of the heart.
W. & C.	Woman and Children.
W. O.	Warrant Officer.
W. I. D.	Western Independent District.
%	Per cent.

Annual Report on the Health of the Army in India for the year 1939.

VOLUME II.

PART I.

SECTION I.

ON THE HEALTH OF THE BRITISH ARMY IN INDIA.

TABLE 1.

General health statistics of the British Army in India during the year 1939.

	Ratios per 1,000 of strength.			
	Admissions.	Deaths.	Invalids sent home.	Constantly sick.
Officers	435·1	2·14	25·09	14·88
Other Ranks	666·1	2·75	9·14	27·96
Members of Nursing Service.	439·6	..	43·90	18·57
Other Ranks' Wives	263·9	0·83	5·54	8·78
" " " —confinements	192·1	...	...	7·09
" " Children	374·1	12·30	3·41	11·43
Royal Air Force	250·6	2·58	2·84	4·87
Royal Navy	143	1	...	5·97
Royal Indian Marine	...	...	...	...
R. A. F. Women and Children.	53	...	...	1·89
R. A. F. confinements	47	...	...	1·64
Others:				
Men	572	10	...	20·51
Women	308	5	4	8·25
Women confinements	152	1	...	5·65
Children	234	10	...	5·53

N.B.—The figures below the horizontal line represent actuals.

GENERAL SURVEY.

1. General.

The health of the British Army in India has on the whole been thoroughly satisfactory, although, as will be seen below the admission rates for both officers and men have increased compared with the previous year, both for general admissions and for particular diseases.

This increase is more apparent than real in that there have been considerable reductions in the strengths of both officers and men of the British Army in India during the year. These reductions took place principally in the latter half of the year, and many of the sick and unfit from the units which proceeded out of the country remained to affect relatively the proportion of "sick" to strength.

Actually there has been a reduction of nearly 100 admissions for officers and over 2,000 for men during the year, and ratios of sickness based on the original strengths would give a yet happier picture of the health of the Army.

In spite of the figures shown in Table 3 we can safely claim that the year has been satisfactory, particularly so in view of the increased chances of disease which war activities have brought, and that from the medical point of view the fighting fitness of the army is good.

The ratios per 1000 for admissions, deaths and invaliding for officers and other ranks for the quinquennial periods from 1910 exclusive of the years of the Great War to date are given below for a comparison of the general health over the past 30 years.

TABLE 2.

Comparative Table—General sickness of Officers and Other Ranks.

Ratio per 1,000.

Periods.	Admissions.		Deaths.		Invalids.	
	Officers.	Other Ranks.	Officers.	Other Ranks.	Officers.	Other Ranks.
1910—14	567·5	567·2	5·14	4·36	16·30	7·03
1920—24	676·7	791·9	6·71	5·24	20·99	18·91
1925—29	589·9	619·4	5·25	2·90	17·44	13·50
1930—34	428·6	601·7	6·69	2·64	20·09	8·88
1935—39	436·9	597·4	4·82	2·54	21·24	9·47

It will be noted that the admission rate for other ranks for the quinquennial period is still further approaching the figure given by the pre-Great War quinquennial period 1910-1914 in spite of the figure of 666·1 per 1,000 for the year 1939.

The death rate for B. O. Rs. has fallen still further in the last quinquennial period and at 2·54 is less than half that of the post-war figure.

Officers admission rates are slightly higher for the quinquennium but their death rate is satisfactorily low.

Invaliding on the other hand shows little tendency to drop either for officers or other ranks partly because transport facilities were easy prior to the outbreak of War and partly because we require officers and men to be completely fit for general service.

The following table shows the relative incidence for officers and other ranks year by year for the past 5 years.

TABLE 3.

Comparative Table—General sickness of Officers and Other Ranks.

Ratio per 1,000.

Year.	Admissions.		Deaths.		Invaliding.	
	Officers.	Other Ranks.	Officers.	Other Ranks.	Officers.	Other Ranks.
1935	470·1	567·1	6·74	2·55	24·25	6·90
1936	428·8	582·1	6·17	2·48	22·92	10·99
1937	421·4	567·8	3·41	2·15	18·00	10·97
1938	428·9	603·7	5·63	2·78	15·95	9·35
1939	435·1	666·1	2·14	2·75	25·09	9·14

2. Officers.

For this year admissions show a further rise of about 7 per 1,000, the rate being 435·1 compared with 428, 421, 428 and 470 of the previous years.

The principal causes of sickness were as follows :—

TABLE 4.

	Per 1,000.
Malaria	36·8
Dysentery	36·8
Jaundice catarrhal	29·9
Cellulitis	26·2
Sandfly fever	25·1
Tonsillitis	20·8
Diarrhœa	19·8

The dysentery-diarrhœa group has come well to the fore with a 56 per 1,000 incidence but malarial cases have relatively decreased. The other main insect borne disease, Sandfly fever, has definitely increased this year.

These two *preventible* disease groups form the bulk of admissions amongst officers.

The relatively high position which is held by catarrhal jaundice amongst officers is striking and has received repeated attention by full laboratory investigation but without specific result.

The Respiratory diseases produce no marked number of admissions but the injury and minor septic group; concussions, contusions, fractures and cellulitis as a combined group are as usual well in evidence.

The death rate, in spite of the increase in admission rates, has fallen sharply, at 2·14 being less than half that of the previous year and far less than any other previously recorded year. The causes of death were: Pulmonary tuberculosis, Pneumonia lobular, acute anterior Poliomyelitis and fracture —1 each.

The average constantly sick has increased slightly 14·88 compared to 13·86 of 1938 and the invaliding rate has jumped up by 10 per 1,000 to 25·09 for this year.

The principal causes of invaliding were: Pulmonary tuberculosis, 6, Chronic bronchitis 3, Fractures 3.

506·7 per 1,000 were treated as out-patients compared to 527·9 in 1938

TABLE 5.

Comparative table for sickness of officers over the past 10 years.

	Ratios per 1,000.		
	Admissions.	Deaths.	Invaliding.
1930	392·3	5·95	21·69
1931	420·4	7·76	17·68
1932	463·2	6·54	27·45
1933	437·8	6·37	17·83
1934	429·2	6·83	15·78
1935	470·1	6·74	24·25
1936	428·8	6·17	22·92
1937	421·4	3·41	18·00
1938	428·9	5·63	15·95
1939	435·1	2·14	25·09

3. Soldiers.

During the present year there has been a further sharp rise, 63 per 1,000 in admission rates from 603·7 in 1938 to 666·1 in the present year, a figure well in excess of any since the post-war quinquennium 1920-24: (see Tables 2 and 3).

The actual number of admissions showed the appreciable reduction of 2,000 (approx.) on the previous year, the relative increase being due to the departure of considerable numbers of British troops overseas and the retention in India for a time of their unfits.

The principal causes of admission to hospital showing increase or decrease compared with the previous year were:

Table 6.

Comparative Table of diseases.

	1938.	1939.	Increase or decrease.
Malaria	50·4	58·1	+7·7
Cellulitis	45·2	51·1	+5·9
Tonsillitis	33·7	34·4	+0·7
Gonorrhœa	28·0	32·7	+4·7
Sandfly fever	24·8	30·7	+5·9
Dysentery	26·8	29·0	+2·2
Bronchitis	17·2	18·2	+1·0
Diarrhœa	18·0	18·2	+0·2
Sprain and strains	18·1	17·0	—1·1
Pharyngitis	10·3	14·8	+4·5
Fractures	13·8	14·6	+0·8
Contusions	12·2	12·7	+0·5
Impetigo contagiosa	12·4	11·3	—1·1
Common cold	11·8	11·2	—0·6
Soft chancre	7·9	10·2	+2·3
Dengue	3·9	9·6	+5·7
Tinea	11·7	9·5	—2·2
Synovitis	7·9	9·4	+1·5
Influenza	13·2	9·3	—3·9
Syphilis	7·6	8·4	+0·8
Boils	7·7	8·2	+0·5
Constipation	7·3	8·2	+0·9
Appendicitis	7·6	8·0	+0·4
Coryza	6·6	7·6	+1·0
Gastritis	7·6	6·8	—0·8
Otitis Externa	4·9	6·4	+1·5
Jaundice catarrhal	5·9	6·3	+0·4
Urethritis	4·2	5·9	+1·7
Wounds	6·1	5·6	—0·5
Headache	4·8	5·3	+0·5
Otitis Media	2·9	4·3	+1·4

It will be seen that Malaria has again increased and has the highest increase of all the common diseases. The insect borne group are much in evidence in the increases. Malaria, Sandfly fever and Dengue between them being responsible for just over 90 per 1,000 admissions, an increase of 19·3 per 1,000. This has been due in part to the effects of troops movements, the early return of troops to the plains, the manning of defence posts and the appearance of malaria and dengue in epidemic form in certain districts.

Venereal diseases with an increase of 7·8 per 1,000 have caused some anxiety in one or two stations at which British units with a predeliction for these infections have had considerable numbers in hospital at a time. On the whole the increase is more apparent than real owing to the reduction of actual strengths.

The dysentery-diarrhœa group still exacts a large toll of admissions, as does the injury-septic group ; the latter is however a concomitant of intensive training and activity.

Respiratory diseases have been little in evidence, there have been no epidemics other than minor outbreaks of mild influenza and pharyngitis. 13 diphtheria " carriers " were admitted to hospital and in one station a batch of 60 contacts had to be detained in hospital for want of other accommodation during a " down hill " move interrupted by some cases of diphtheria.

In Waziristan unsettled conditions continued throughout the year and many "columns" were out. Operations were undertaken in the Shaktu Valley in February and March. In spite of snow and slush and unusual rain the health of troops remained good with a decrease of 67 per 1,000 in the admission rates and a reduction of average constantly sick during the year.

In Northern Command the downward trend of sick rates which commenced 10 years ago has been broken by an increase of 50 per 1,000 during this year. This increase is almost entirely due to Lahore District where there was a jump from 567 to 714 per 1,000 for admissions caused by the early return from the hills into areas where malaria was more prevalent than usual and to security posts away from cantonments. In addition there was an unexpected rise in July due to malaria at Razani Camp in Waziristan where half the Razmak garrison spent the summer. Razani is a definitely malarious site with surrounding villages badly infected thereby; sandfly fever was also very high.

The *death rate* was 2·75 per 1,000 which is almost the same as 2·78 of last year and little above the quinquennial average of 2·54.

The actual number of deaths was reduced.

The chief causes of death were :

Local injuries (including 18 gunshot wounds)	0·78 per 1,000
Infectious diseases	0·58 „ „
General injuries	0·39 „ „
Digestive diseases	0·36 „ „
Circulatory diseases	0·19 „ „
Pneumonia	0·14 „ „

Invaliding, at 9·14 per 1,000, shows a further reduction but must be viewed from two entirely different aspects: the pre-war rate of the early months, which was 5·63 and the post-war rate of at 3·51 during a period when shipping facilities were interrupted and the dispatch of invalids had at times to be restricted.

Invaliding rates for the past 4 years have been 10·99, 10·97, 9·35, 9·14 per 1,000.

As usual Mental and Tubercular conditions form the bulk of cases requiring to be invalided, a total of 2·73 per 1,000 or over one quarter of all invaliding. In this year however Tuberculosis retires from the head of the list, Mental disease having produced 1·56 per 1,000 invalids.

It will be noted that apart from Injuries invaliding for the effects of diseases as such is at a most satisfactorily low figure.

The *Average number constantly sick* in hospital was 27·96 per 1,000 of strength compared with 27·61 per 1,000 in 1938 and 27·02 per 1,000 in 1937 a general rise of nearly 1 per 1,000

The diseases chiefly responsible were :

TABLE 7.

Average constantly sick per 1,000 of strength.

Gonorrhœa	2·42
Malaria	2·32
Cellulitis	1·64
Dysentery	1·37
Fractures	0·92
Tonsillitis	0·82
Soft chancre	0·76
Syphilis	0·68
Bronchitis	0·64
Sandfly fever	0·62
Appendicitis	0·52

Once again Gonorrhœa produces the greatest number of average constantly in hospital but there has been a very welcome reduction of nearly 1 per 1,000 in the rate (2·42 compared to 3·11) and we may hope that this may be further reduced when the full effects of the sulphonamide group of drugs begins to take effect.

Malaria at 2·32 per 1,000 shows a slight increase due to the general rise in malarial admissions. Our methods of treatment are standardised and satisfactory.

Out-patients.—1783·9 per 1,000 were treated as out-patients, an increase of 179 per 1,000 on the previous year. This is certainly due to the disturbed conditions of the war period and the manning of numerous defensive posts. The average daily number under treatment was 25·10 per 1,000.

The combined ratio of constantly sick in hospital and under treatment as out-patients was 53·06 per 1,000 compared with 52·27 in 1938 and 50·80 in 1937.

The seasonal admission rates for certain diseases and the admission and death ratios per 1,000 of strength for all causes and for certain important diseases at stations with a strength of 1,000 and upwards compared with all India, are shown in the following tables, 8 and 9 and Chart II.

TABLE 8.

Monthly incidence of admissions, all causes, and of the principal diseases.

All ratios per 1,000.

Month.	All causes.	Malaria.	Dysentery, Diarrhœa Group.	Minor Septic.	Local injuries.	Venereal.
January	46·4	1·4	2·5	4·6	5·9	4·7
February	38·0	1·0	2·9	4·4	4·5	3·4
March	44·2	1·4	3·2	3·7	5·1	4·5
April	45·4	1·5	5·4	4·0	5·2	2·9
May	56·3	2·0	4·9	4·9	5·4	4·1
June	58·1	4·5	3·2	4·7	4·8	3·8
July	69·3	8·2	5·3	7·1	6·1	2·9
August	71·7	6·8	6·7	6·8	5·6	3·7
September	69·8	9·1	4·2	7·4	6·4	4·9
October	67·1	9·9	3·5	5·5	5·9	7·2
November	59·4	9·0	3·5	6·1	6·1	4·8
December	43·5	2·6	1·9	5·0	5·9	4·5

TABLE 9.

Table showing total admissions and deaths ratios per 1,000 of the strength for all causes and certain important diseases for the larger stations compared with All-India.

	Stations with total admission ratios, all causes, higher than All India.					All- India.	Stations with total admission ratios, all causes, lower than All-India.		
	Razmak.	Meerut.	Peshawar.	Poona.	Lucknow.		Secunderabad.	Rawalpindi.	Mhow.
All causes :—									
Admissions	784·5	770·5	748·9	701·7	673·0	661·1	626·1	622·2	582·4
Deaths	13·95	6·31	...	1·08	3·06	2·75	...	2·90	...
A. C .Sick	27·12	33·01	29·92	36·78	31·91	27·96	29·14	27·48	26·51
Malaria :—									
Admissions	178·3	67·3	28·3	78·6	14·5	58·1	14·8	51·6	98·2
Deaths	...	...	...	...	...	·11	...	...	...
Sandfly fever :—									
Admissions	34·9	11·2	130·9	...	117·2	30·7	...	69·5	10·0
Deaths	...	...	...	...	...	...	...	...	...
Enteric Group of Fevers :—									
Admissions	...	2·8	2·7	1·6	1·5	1·1	0·6	1·2	...
Deaths	...	·70	...	...	...	·06	...	...	...
Dysentery :—									
Admissions	44·2	51·2	17·7	47·4	41·3	29·0	36·9	24·9	37·4
Deaths	...	...	...	...	...	·06	...	...	...
Diarrhœa :—									
Admissions	26·4	47·0	19·5	4·8	9·	18·2	17·6	9·3	15·0
Deaths	...	...	...	...	...	...	...	...	...
Influenza :—									
Admissions	1·6	15·4	18·6	5·9	9·2	9·3	...	19·1	...
Deaths	...	...	...	...	...	...	...	...	...
Pneumonia Lobar and Lobular :—									
Admissions	3·9	0·7	5·3	1·1	4·6	4·7	2·3	9·3	...
Deaths	...	·70	...	...	...	·14	...	...	...
Minor Septic Diseases :—									
Admissions	52·7	77·8	84·0	53·3	53·6	66·9	58·5	53·9	69·1
Deaths	...	...	...	...	...	...	...	...	...
Venereal Diseases :—									
Admissions	22·5	56·8	21·2	77·5	73·5	51·4	75·6	48·1	51·6
Deaths	...	...	...	...	...	·03	...	0·58	...
Local Injuries :—									
Admissions	93·8	89·7	64·5	52·2	58·2	63·0	94·9	44·6	66·6
Deaths	11·63	...	...	...	·77	·78	...	0·58	...
Heat Stroke : —									
Admissions	...	...	2·7	...	0·8	0·4	...	...	...
Deaths	...	...	...	...	·77	·06	...	...	...
Heat Exhaustion :—									
Admissions	...	0·7	2·7	...	7·7	1·9	...	6·9	...
Deaths	...	...	...	...	·77	·06	...	...	

CHART No. I.

Ratios per 1,000 admitted to hospital, invalids sent home, and constantly sick, and AV-sick time to each soldier from 1921 to 1939.

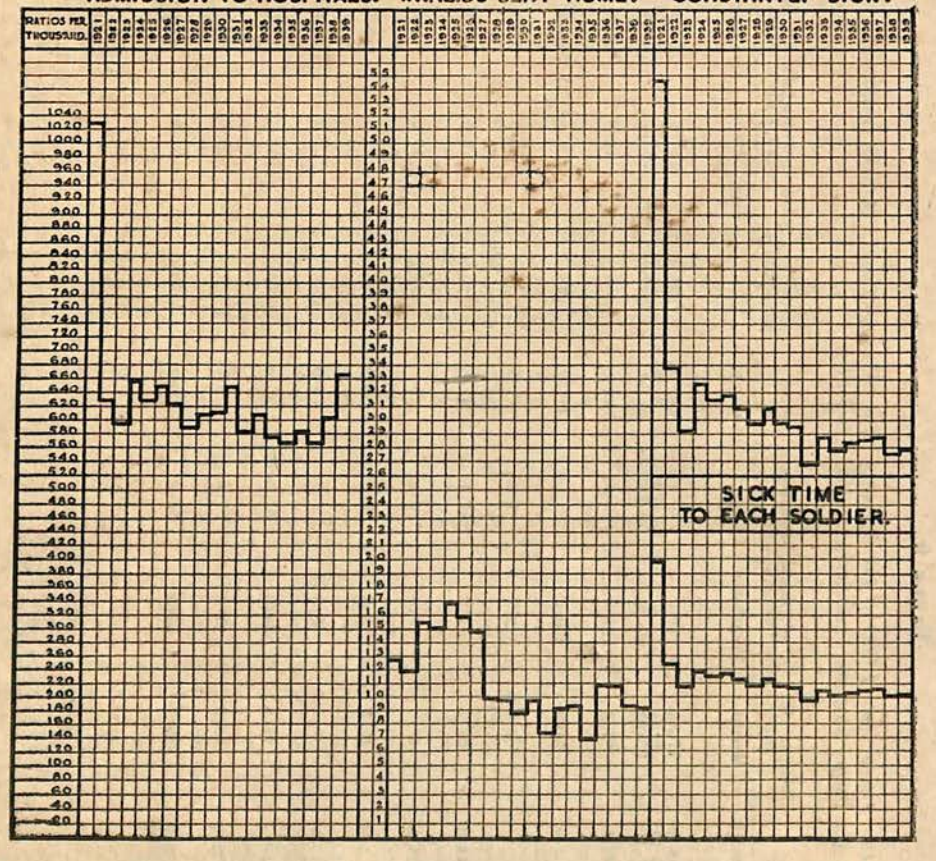
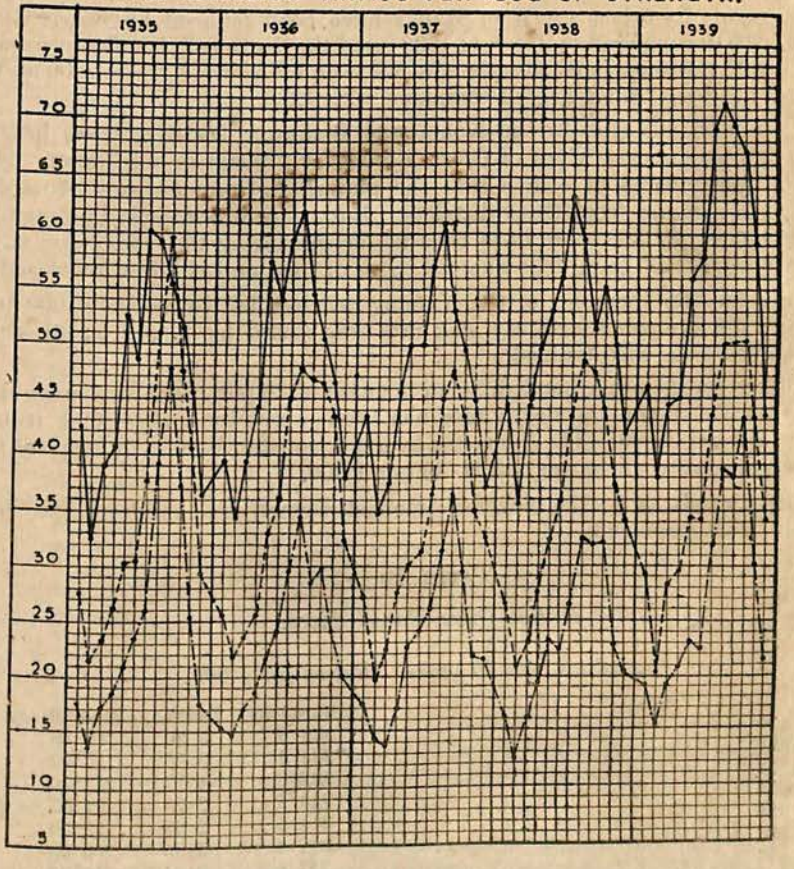


CHART No. II.

ALL INDIA.
TOTAL ADMISSION ALL CAUSES.

BRITISH TROOPS —
INDIAN TROOPS - - -
FOLLOWERS — - —

MONTHLY ADMISSION RATIOS PER 1000 OF STRENGTH.



4. Women and Children.

The admission rates for women have decreased appreciably during the year. One cause, in the north at least, has been stated to be the later reten tion of women and children in the hill stations owing to the moves of troops in the early autumn after the onset of the War.

Admissions for wives of Other Ranks have been reduced by nearly ·50 per 1,000, 263·9 compared to 311·8 of 1938 ; and the death rate has fallen from 3·84 to 0·83 ; the average constantly sick has been reduced by 2 per 1,000 and invaliding has been nearly halved compared with 1938.

It is remarkable that in the Kohat and Peshawar Districts there have been no deaths amongst wives of Other Ranks for 3 years in succession. It should be remembered of course that the majority of women move to the hills for the summer from these districts. But even in Southern Command with a strength of 1,500 there have been no deaths during this year, and admissions dropped 155 per 1,000 whereas those of men and children increased.

Admissions for members of the Nursing Services fell by 60 per 1,000 to 439·6 but the average constantly sick rate was raised by 2 per 1,000 and the invaliding rate was doubled.

Children on the other hand show an increase of 20 per 1,000 for the whole of India to 374·1 and the death rate has been raised by 3 per 1,000, from 9·75 to 12·3 per 1,000. The figure for average constantly sick in hospital is however practically unchanged at 11·43 per 1,000.

Fuller details as to the sickness amongst women and children will be found in paragraph 76.

TABLE 10.

British Other Ranks wives.

Casualties over 10 years. Ratios per 1,000.

Year.	Admissions.	Deaths.	Invaliding.
1930	328·6	5·30	10·83
1931	334·4	5·75	17·02
1932	292·3	4·17	13·20
1933	313·2	2·75	11·45
1934	311·6	2·23	12·50
1935	312·4	3·35	9·33
1936	337·6	3·21	10·85
1937	319·7	3·62	10·13
1938	311·8	3·84	9·99
1939	263·9	0·83	5·54

The principal causes of admission were the same as in last year, *viz.*—

	1939.
Abortion	99
Malaria	77
Dysentery	51
Tonsillitis	33
Pyelitis	32
Diarrhœa	31
Cellulitis	30
Appendicitis	18
Hypertrophy of Tonsils	18
Bronchitis	17
Anæmia	15
Gastritis	10

It should be noted that the combined dysentery-diarrhœa group, 82 admissions, is really the commonest disease group.

In addition 693 women were admitted to hospital for confinement.

There were 3 deaths (0·83 per 1,000) among women, 12 less than the previous year.

The number treated as out-patients was 2,511 or 695·9 per 1,000.

Of *children* the admissions, deaths and invaliding are shown below:

TABLE 11.

British Other Ranks Children. Ratios per 1,000.

Year.	Admissions.	Deaths.	Invaliding.
1930	284·4	12·29	0·92
1931	286·4	12·08	3·32
1932	299·1	12·72	2·09
1933	281·9	11·05	1·42
1934	299·6	11·83	2·31
1935	334·3	9·66	2·15
1936	335·4	13·40	3·23
1937	358·3	12·83	2·60
1938	353·4	9·75	2·74
1939	374·1	12·30	3·41

The principal causes of admission were:

Dysentery	221
Hypertrophy of Tonsils	217
Diarrhœa	173
Tonsillitis	145
Malaria	105
Bronchitis	87
Cellulitis	55
Pneumonia	53
Conjunctivities	39
Jaundice	37
Otitis Media	36
Diphtheria	35
Enteritis	34
Constipation	32
Common cold	32

The preponderance of the dysentery-diarrhœa— enteritis group is again marked with 428 cases or 22 per cent. of the total admissions.

There were 65 deaths amongst children. The principal causes of deaths were pneumonia 9 and enteritis 8. Twentysix per cent. of deaths were due to the dysentery-diarrhœa and enteritis group.

Diphtheria.—In addition to sporadic cases, definite outbreaks occurred at Sabathu where there were 13 cases, Poona 5 cases and Jubbulpore 3 cases.

5. Summary of interesting features of the year.

(*a*) The outstanding feature of the year was the political tension during the summer culminating in the declaration of War against Germany on September the third.

(*b*) The preparation and dispatch of overseas troops and replacements in India went on a pace after the beginning of September ; Territorial forces were embodied ; protective posts and defence areas were manned at all important points, posts and areas which in many cases were outside cantonments and in highly malarious or unhealthy districts were occupied.

(*c*) Although officially it was peace, Waziristan again had troubles and operations were carried out in the Shaktu Valley in February and March in cold, wet weather and there were continuous columns throughout the year. There were remarkably low admission rates for sickness considering the conditions.

(*d*) Tetanus toxoid immunisation was introduced during the year. At first limited to External Defence Troops and later provided for all troops proceeding abroad, provision of Tetanus toxoid is now being made to immunise the whole army. The possibilities of indigenous manufacture of the Toxoid were closely examined but early success was impracticable and indigenous provision was abandoned for the time.

(*e*) There has been a general increase in sick rates for both Officers and men, though there have been no serious epidemics. Invaliding rates have increased appreciably for Officers, but slightly decreased for Other Ranks and death rates have decreased for both. The 4 quinquennial periods since the last war have shown a steady decrease in sickness and death both for Officers and men.

(*f*) Malaria was not severe except in certain areas in the south and east, but in the north, while not extensive in amount, it extended late into the autumn due to a prolonged warmth. The general trend of the graphs of malarial incidence remains satisfactory.

(*h*) The dysentery-diarrhœa group shows no signs of decrease in the numbers of cases and continues to exact a heavy toll in all Commands.

(*i*) Enteric fevers although showing a slight rise in admission rates is held satisfactorily in check although there is ample evidence that it is widely spread around many of our cantonments.

(*j*) Dengue and Sandfly fever were both much in evidence in Eastern Command, the former at Calcutta in the summer, the latter at Agra after abnormal rains in September.

(*k*) Spraying as a defensive measure against all insect borne diseases has been continued with increasing vigour and often with success, particularly in Northern Command, against the Sandfly. Arrangements are now well in hand for production of pyrethrum spray solutions in our own Medical Stores Depots from Empire grown pyrethrum flowers from Kenya.

(*l*) With the advent of War frequent offers of help with special remedies to cure some or all of the ailments of the soldier were received. Some were patriotic and without personal advantage to the offerer, others were on a commercial basis. Many were completely useless as for example that of the gentleman who offered to cure all malaria with a few doses of his special medicine which on examination proved to be nothing but common salt.

6. Factors which may have affected the incidence of disease amongst Troops.

(*a*) *Climatic conditions.*—In the north the year has been dry and dusty with a late warm autumn while in the south conditions have been ave rage

Taking the year as a whole the rainfall was 27 per cent. or more in defect in the Punjab, Sind, Rajputana, Gujarat and north Hyderabad and was nearly up to normal in the South and East.

Early in the year there was abnormally heavy rain on the Frontier with enhanced sick rates in February, and in north-west India. This was succeeded after a definite cold wave by a trying hot weather with high humidity. A scanty and deficient monsoon period was followed by a prolonged, warm autumn which carried malaria and sandfly fever into the late autumn months.

Defective rainfall was markedly accentuated in Rajputana and West Central areas where famine conditions prevailed. The chief military station affected was Nasirabad where shortage of water lead to evacuation of certain troops.

Heavy rainfall in the late monsoon occurred in the United Provinces and eastwards and a very heavy fall round Agra and Cawnpore resulted in a marked rise in sandfly fever, 50 cases in one day at Agra. With the excess rain in Bengal and eastern United Provinces an epidemic of Dengue was recorded from Lucknow and considerable numbers in Calcutta. High summer and autumn temperatures also ruled in this area.

In the South rainfall and temperatures were average except on the west coast and in the Bombay area where local excess lead to conditions favouring malaria.

The extreme conditions enjoyed by troops in Waziristan are worth noting. Temperatures which range from the 25 degrees of frost in winter to 122°F in the summer; rain of which half the annual fall may be experienced in one storm and relative humidity which varies from 9 to 99 per cent in the course of a few days.

(*b*) *Seasonal incidence of main diseases.*—These followed their normal course with one or two exceptions. The seasonal incidence of total admission is shown overleaf in graphic form.

Malaria was prolonged into the autumn in northern India by the late warm autumn, the makings of a heavy malarial season in this area were nullified by dry weather, except at Ambala and in Meerut District where rainfall was considerable and minor epidemics occurred. In the Bombay area there was however a malarial epidemic which was reflected in the increased malaria amongst troops who were on outpost duties. The malarial rate for troops in Bombay is 78 per 1,000 which is 50 per 1,000 more than in 1938; sixty per cent. of these admissions were from men actually on outpost duties.

Sandfly fever was in evidence in the autumn in the U. P. after the abnormal storms which in Agra did considerable damage and later favoured sandfly breeding.

Small-pox was prevalent in many areas and appeared in epidemic form in the country round Abbottabad and at Ambala in the Railway colony and the Saddar Bazaar and at Ferozepore and in Tribal territory on the Frontier. At Abbottabad 2 I. O. Rs. and some families were infected.

The *dysentery-diarrhœa group* was almost epidemic in the spring and autumn fly seasons at stations in the Northern Command.

(*c*) *Health and Diseases of Civil Communities—1939.—Cholera.*—In India, the endemic home of cholera, widespread dissemination has occurred after pilgrim festivals. In January 1939 the Central Advisory Board of Health examined the matter of compulsory inoculation but it was decided that the time was not yet ripe for total compulsory inoculation.

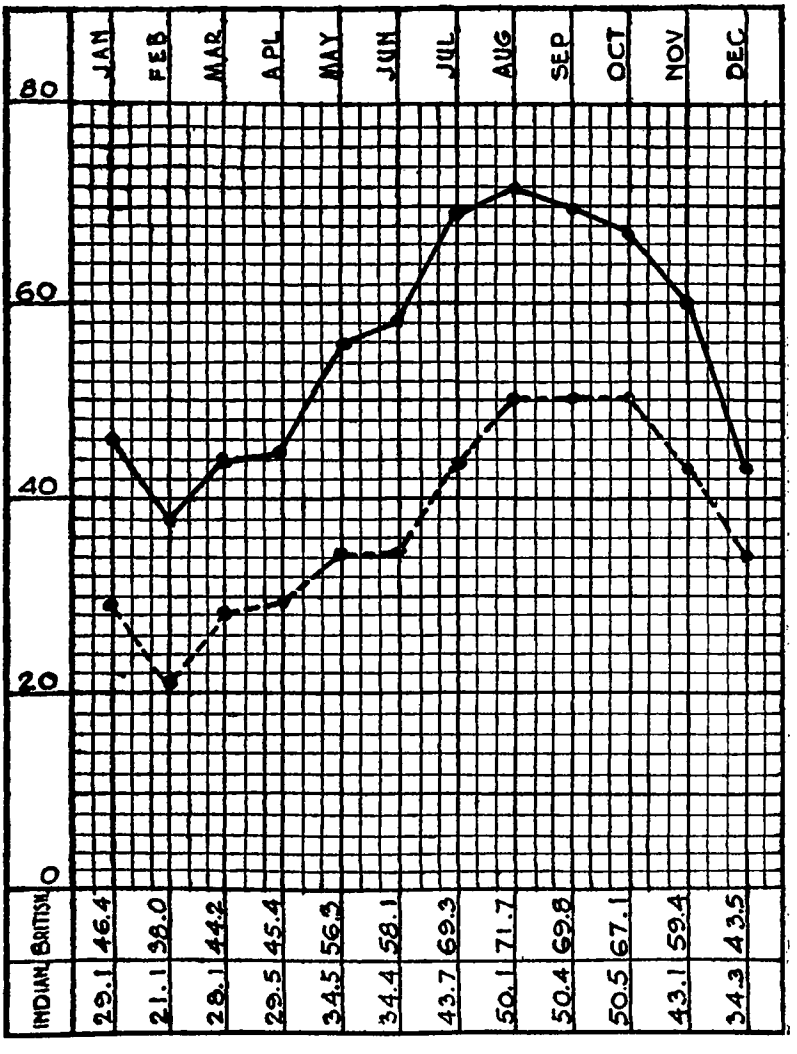
CHART No. III.

BRITISH ——

INDIAN - - -

ALL INDIA 1939.

TOTAL ADMISSIONS ALL CAUSES. RATIO PER 1000 OF STRENGTH.



The Government of Bombay after 4 years have had remarkable success in dealing with two big festivals at Pandharpur; and in all Provinces voluntary inoculation has had a considerable effect. The Punjab Government has expended 1¼ lakhs of rupees during 1939 and the Madras Government has arranged a scheme for Rs. 15 lakhs for improvements of the water supply in villages.

During the year cholera has been intermittent in different areas. An autumn epidemic in Delhi Province—widespread in the U. P., in Bihar and Orissa and prevalent to epidemic in Cuttack and Puri.

The C. P., Sind, Madras and Assam were relatively free of the disease.

Plague.—In epidemic form this has been confined to the U. P., Bihar, the C. P., and Bombay and Madras Presidencies. The C. P. had relatively the greatest amount, 6,300 cases.

Small-pox.—The disease continued prevalent throughout the country and deaths in the age groups 0-1 and 1-10 indicate to what extent primary vaccination is evaded. In Madras city there was a widespread epidemic, an epidemic in the N.-W. F. P. round Abbottabad, an average year in the Punjab and Delhi Province, widespread in the U. P., C. P. and Bombay and prevalent to epidemic in Bihar, Orissa and Bengal.

Malaria.—Urban Malaria is stated to have been extensively attacked in all large capital towns during the year by controlling Acts and strict supervision. The use of fish, Gambusia, in private and public wells has achieved success. The most remarkable results are those achieved in the Delhi urban area.

Industrial Malaria has been dealt with as a commercial measure on plantation, mines, factories and Railways. The most valuable method is said to be spraying of quarters with Pyrethrum insecticides.

Rural Malaria has been receiving attention from Provincial Governments. In the N.-W. F. P., the Punjab, Orissa and Bengal malaria decreased or was even relatively scarce. But in Bihar there was a widespread epidemic and considerable amounts in the C. P., Bombay and Sind. An unusual epidemic was reported from Madras Presidency and Coorg.

Enteric Fever.—This was universally present, epidemic in many areas markedly prevalent in the North, East and South and only less in Bombay and Ajmer areas.

Tuberculosis.—This is receiving annually ever more attention. Fresh Sanatoria are being opened and preventive and curative work increased in many provinces. The large increase in known cases which has been noted may therefore not necessarily be an actual increase. But lay and medical opinion in Bengal and other provinces believes that the disease is definitely on the increase.

Cerebrospinal Fever.—The total cases in the year have been less. Incidence was sporadic and more conspicuous in the first half of the year.

Dysentery, has been widespread and noted in hygiene reports from many cantonments as being very prevalent in neighbouring civil bazaars and municipal areas.

(*d*) *War and the movement of Troops.*—The pre-war tension, the onset of war and the subsequent movement of troops, calling up of reservists, arrival of recruits and the manning of security points had a very definite effect on the health of the army. This is reflected in the general rise in admissions; in the increased malaria of British troops brought down more than a month early from the hills, in the increased malaria in Indian units due to the influx of

returning leave men, reservists and recruits arriving from their homes already infected ; in the increased dysentery in certain stations and the relative increase of unfits in depot stations from which units had departed. In fact so great has been the effect of this factor that only a perusal of the sections on disease will show the full effects.

After the outbreak of War overcrowding in barracks was common in many stations. This was in most cases only temporary and produced no ill effects, medical officers were however watchful and precautions such as " head and tail " arrangements of beds were put into effect where necessary.

One remarkable result is shown in paragraph 64 dealing with hot weather precautions in that British troops and their families could be moved by train during the hot weather months without serious harm, *provided* adequate precautions were taken throughout the journey. Likewise drafts of young British troops arrived during hot weather months without any grevious consequences.

The manning of defensive posts had a marked effect on the health of troops because preventive measures against malaria or sandflies or fly borne dysentery were in some cases not successfully carried through or even not used at all.

Civil disturbances affected two groups of troops ; one in the east where a small force of troops was out in the Cuttack District for several months and the other in the west where disturbances at Sukkur in November necessitated the presence of troops for some weeks. Health remained remarkably good in spite of troubles with dust, flies and mosquitoes and in spite of camping sites unsatisfactory from every hygienic point of view.

Principal Diseases affecting British Troops.

7. Malaria.

Considering the conditions malarial admission rates have been satisfactory for all India. It is true that the admission rate at 58·1 per 1,000 is higher than the good years 1935-37, but reductions in total strengths during the autumn partly account for this apparent rise and the early return to the plains and war activities already referred to in paragraph 6(*d*) are definitely the cause of the real increase.

The increase for all India is entirely due to " Fresh " cases which have risen by nearly 11 per 1,000 whereas " Relapses " have decreased by 3 per 1,000, *vide* Table 14.

The all India incidence of total cases for past years is shown below in Table 12 and even more clearly in graphic form for the past 20 years in chart No. 2.

TABLE 12.

Malarial incidence over past 10 years.

Ratios per 1,000.

	British.	Indian.
1913	125·5	100·4
1919	217·8	145·6
1930	118·4	153·4
1931	112·5	149·4
1932	84·1	145·0
1933	103·3	212·2
1934	67·5	156 5
1935	56·1	125·9
1936	58·0	123·1
1937	44 5	97·9
1938	50·4	109·6
1939	58·1	118·3

Factors affecting malarial admissions.—There are three main factors usually responsible for the general malarial rate.

(*a*). Annual variations of climate, which however may show very considerable local differences in a country the size of India. In the present year there have been very marked differences. In the north a dry summer extending into the late autumn fulfilled the forecast made by the Director of Public Health, Punjab, that there was no likelihood of any widespread or severe epidemic in the Punjab. In the east heavy rainfall in Lucknow and Meerut Districts had some bearing on the increase in fresh cases of malaria. In the south an average rainfall of rather intermittent type lead to a marked prevalence of malaria in the areas of Bombay and the Central Provinces.

(*b*) The efficiency of our anti-mosquito measures which are dependent firstly on the funds which are available for the purpose and secondly on the intelligent co-operation of all military personnel.

(*c*) The efficiency and thoroughness of our anti-malarial treatment.

(*d*) In the present year we have the additional factor of war movements and dispersion of troops outside the protected areas of our cantonments.

The results of these factors are clearly shown year by year in Chart No. IV which clearly indicates the satisfactory results of our efforts on the factors likely to produce a high malarial incidence. The graph of British incidence is the truer guide to the effects of our methods because that for Indian troops is more affected by conditions outside our control; men frequenting cities, bazaars and villages outside cantonments and proceeding to and returning from leave in uncontrolled, heavily malarious areas; recruits and reservists arriving from malaria infected homes. In this graph is shown the drop in military cases after the introduction of our present system of anti-malarial measures in all cantonments in 1924-26 and the second drop which occurred after the introduction of our present method of treatment with atebrin and plasmoquine in 1931-32.

A third method of prevention which was mentioned in last year's report *viz.* spraying with insecticides which was introduced in 1935-36 appears to have commenced a further drop in the graphs but has been upset by the abnormal war conditions of the present year.

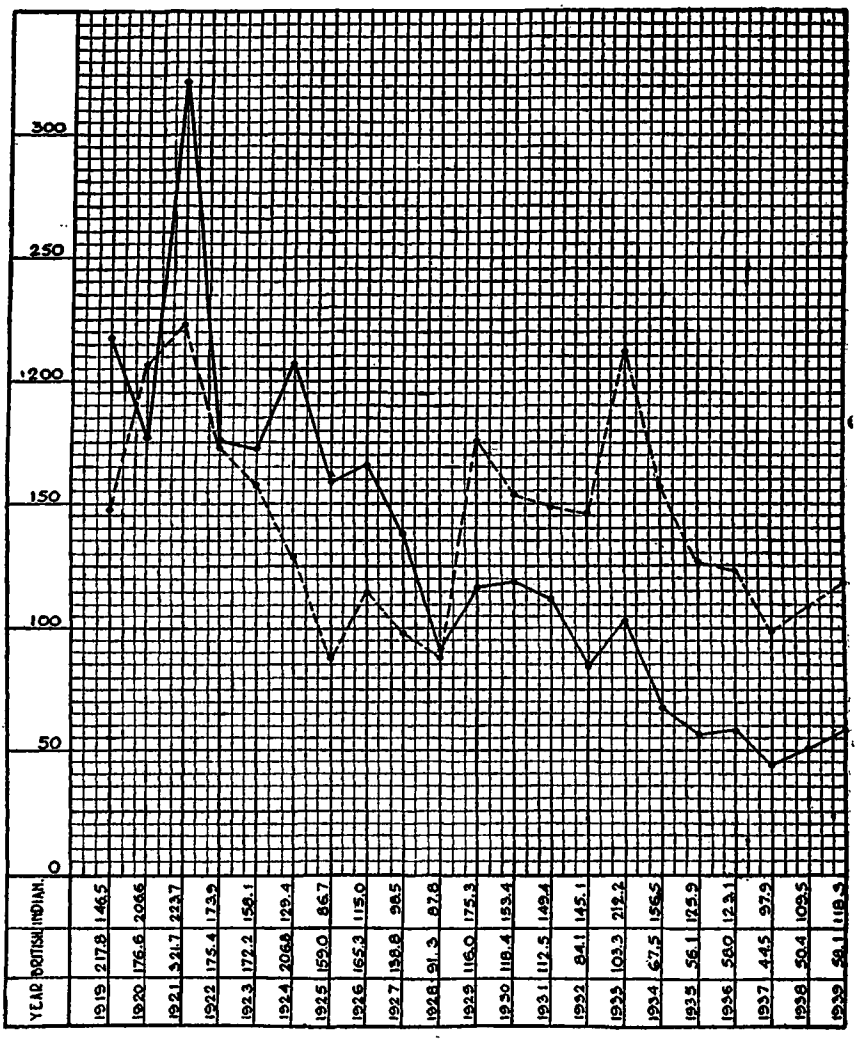
Anti-malarial measures in cantonments.—Cantonment anti-malarial schemes have been continued with skill, enthusiasm and success. The work carried out has now reached the pitch where it is becoming an integral part of cantonment life; so much so that the "dry day" is regarded as a normal procedure and complaints are readily launched at or to the anti-malarial officer should mosquitoes become unduly evident (even though they be clouds of culicines brought in by the wind from outside areas). The relative safety of cantonments is shown partly by the difference in British and Indian malarial rates and during the present year by the heavy incidence which occurred amongst troops posted to security posts away from cantonments. For example at railway protection posts in the north and east and in the Bombay area at similar posts nearly 100 per cent. of the men were infected in September and early October. In recent years it has been rare to get fresh malarial infections amongst British troops at Colaba, in the present year 43 fresh cases were directly attributable to the defence scheme which necessitated outposts in docks and other surrounding areas. Protective measures were not carried out as thoroughly as they should have been.

CHART No. IV.

MALARIA.

BRITISH ——
INDIAN - - - -

ADMISSION RATIO PER 1,000 OF STRENGTH.



YEAR	BRITISH	INDIAN
1919	217.8	146.5
1920	176.6	206.6
1921	221.7	223.7
1922	175.4	173.2
1923	172.2	158.1
1924	206.8	129.4
1925	152.0	86.7
1926	165.3	115.0
1927	138.8	98.5
1928	91.3	87.8
1929	116.0	175.3
1930	118.4	153.4
1931	112.5	149.4
1932	84.1	145.1
1933	103.3	212.2
1934	67.5	155.5
1935	56.1	125.9
1936	58.0	123.1
1937	44.5	97.9
1938	50.4	109.5
1939	58.1	118.3

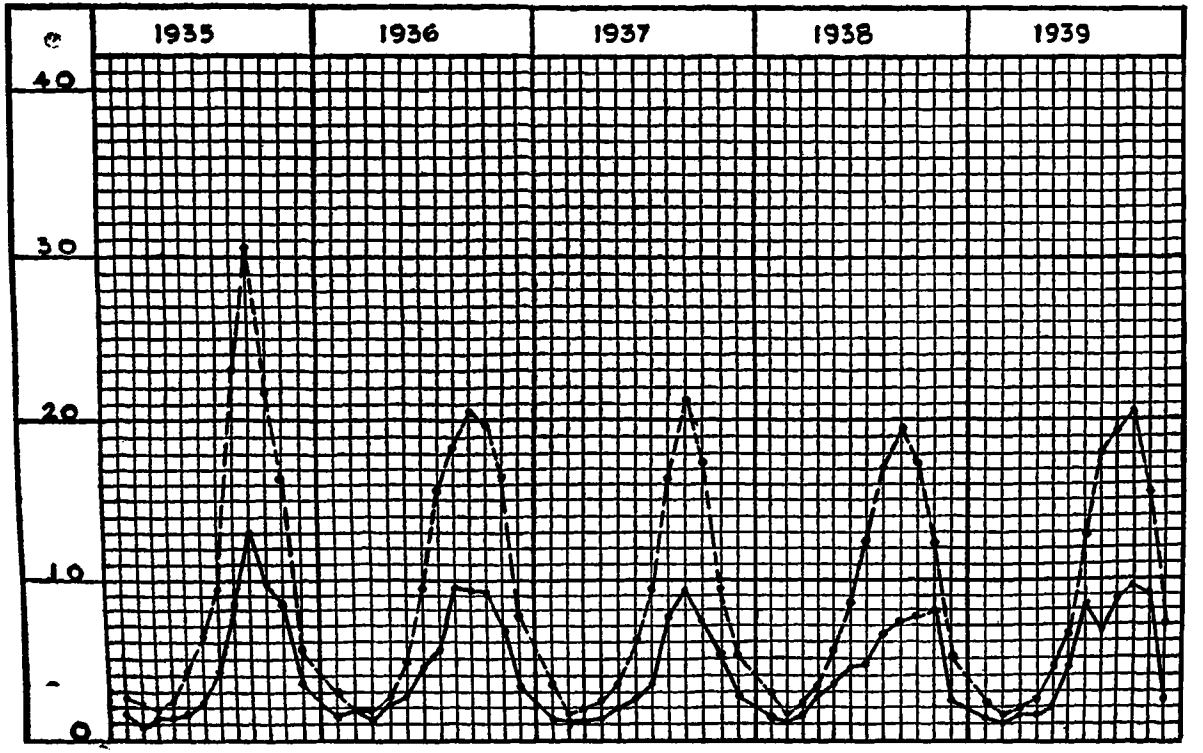
The seasonal incidence of Malaria for British and Indian troops is well shown in chart No. 5 giving the monthly incidence over the past 5 years:

CHART No. V.

MALARIA ALL INDIA

BRITISH TROOPS = ——
INDIAN TROOPS = - - - -

MONTHLY ADMISSION RATIOS PER 1000 OF STRENGTH.



In the Western Ind. District a bad malarial year was forecast but very energetic antimalarial measures were instituted and proved so successful that the total cases were the lowest for 8 years. "When it is realised that in the Lora river about 2 miles from and outside cantonments the mosquito larvae were so thick in July that the water presented a heaving black mass and 35,000 mosquitoes were trapped, the majority being almost equally divided between Anopheles subpictus, culicifacies and stephensi; and yet 1939 is the second lowest malarial year on record; one must come to the conclusion that anti-malarial measures were of some avail."

As illustrative of the reduction in cases in large cantonments the following table is of interest showing the actual admissions at Rawalpindi and Lahore over a series of years.

TABLE 13.

British Malarial cases in Rawalpindi and Lahore.

Actual admissions.

Year.	Rawalpindi.	Lahore.
1924	..	4370
1925	473	2245
1926	469	2479
1927	549	1524
1928	370	886
1929	433	1097
1930	133	1320
1931	86	1047
1932	69	679
1933	70	1047
1934	64	371
1935	50	296
1936	106	303
1937	84	171
1938	94	114
1939	41	292

It should be noted that at Lahore a considerable proportion of the British garrison is in barracks in a small enclave in the middle of the town and away from the protection of cantonment hygiene.

The beneficial results obtained by spraying barracks, quarters and followers lines with insecticide sprays is becoming more and more evident from reports from all stations. A systemetic programme of spraying is essential. We have now succeeded in introducing an official pyrethrum spray solution at cheap rates for indent purchase from medical stores. This is made available to all anti-malarial officers and may be purchased by individuals for self protection. The concentrated extract or ready made solution are prepared by Medical Stores Depots from Empire (Kenya) produced pyrethrum flowers (see paragraph 64-B).

Treatment.—The standard method of treatment detailed in last year report has been continued with success.

As soon as War became likely steps were taken to investigate the possibility of obtaining Atebrin and Plasmoquine from Empire sources instead of from our potential enemy. This point received reference in the previous report namely the extreme unsoundness of a method which relied on enemy firms for its source of supply.

At the outbreak of War stocks were reviewed and enquiries set on foot to obtain supplies from Empire sources and orders were issued to restrict the use of Atebrin and Plasmoquine to their legitimate use of treatment of malarial cases. The British made drug, Tebetren was investigated and a trial was instituted, but some-what late in the season. The results have been sufficiently good to encourage further trial.

The prophylactic treatment of troops with atebrin received a large scale trial in Waziristan, but the results were very indifferent and further use for this purpose has been stopped. Details of this trial are given in paragraph 64B (*c*) (*iv*).

The following Table gives the admissions for " fresh and relapse " cases by Commands over the past 5 years and shows a satisfactory position for all India and Southern and Eastern Commands for relapse rates, though in Northern and Western Commands relapse rates have increased somewhat.

TABLE 14.

		Admission ratios per 1,000.				
		1935.	1936.	1937.	1938.	1939.
Northern Command	Fresh.	44·1	45·6	30·2	34·0	51·8
	Relapse.	13·2	32·8	15·3	22·0	24·0
	Total.	57·3	78·5	45·6	56·0	75·8
Eastern Command	Fresh.	31·4	30·5	14·9	19·4	25·8
	Relapse.	13·4	6·3	9·0	13·6	5.9
	Total.	44·8	36·8	23·9	33·0	31·8
Southern Command	Fresh.	38·8	36·3	34·2	43·7	51·0
	Relapse.	10·2	9·0	9·0	16·3	10.8
	Total.	48·9	45·3	43·2	60·0	61·8
Western (Ind.) Dist	Fresh.	111·3	56·8	101·5	38·3	43·1
	Relapse.	24·8	47·1	22·0	21·0	25·2
	Total.	136·1	103·9	123·5	59·2	68·3
All-India*	Fresh.	43·1	39·2	32·6	32·6	43·3
	Relapse.	13·1	18·7	12·0	17·8	14·8
	Total.	56·1	58·0	44·5	50·4	58·1

*1937 and 1938 do not include Burma.

In Southern Command at Mhow where 31 per cent. of B. T. cases and 19 per cent. of malignant tertian cases relapsed it was particularly noticed that it is the same individuals who come into hospital year after year and their condition is probably that of reinfection and not relapse.

Malarial situation in Commands.—In Northern Command although there was a moderate increase in total rates due to increases in fresh and relapse, the incidence is markedly less than it was 10-15 years ago. The disease incidence has really shown itself in two distinct and contrasting areas. A southern zone with high rates in Lahore District and Waziristan District, Western Ind. District shared in this increase in prevalence ; and a northern zone with low rates, Peshawar District with the lowest rates ever recorded, 33 per 1,000, Rawalpindi District with the remarkable figure of 41 cases and Kohat District with low rates except for cases imported from Multan. The Rawalpindi admissions of the past 4 years are worth noting : 106-84-94-41.

In Waziristan there was a heavy outbreak at Razani Camp due to infection from neighbouring uncontrolled villages. In Lahore District including Multan, Ferozepore, Lahore Cantonment and Ambala light scattered showers, high humidity and a late summer which was prolonged well into the late autumn

at a time when troop movements and unusual postings were in progress, were responsible for definite malarial outbreaks.

In Delhi Province military personnel have shared in the benefits achieved by the Malaria Institute of India in the anti-malarial improvements which have been made round Delhi and New Delhi.

In Eastern Command the excess rains in the U. P. lead to a slight increase in fresh cases limited chiefly to Meerut District although civil reports show there was marked prevalence in Orissa and Bengal.

In the South the malarial incidence was rather less than usual in Madras and Deccan Districts, although civil reports indicate an unusual epidemic in Madras Presidency. In Bombay District malaria was widespread and prevalent in the civil population and military personnel were similarly affected. Admission rates at Mhow and Jubbulpore were also markedly increased. In the Bombay area lack of attention to recognised methods of prevention or lack of discipline were definitely the cause of many admissions; for example at one defensive outpost of 32 men nets were not used for the first 4 days because no means of supporting the nets over the men's beds had been provided, of this group 32 men were eventually admitted for malaria; in another case a surprise visit by the medical officer discovered 11 men in one room and 9 men in another sleeping in a malarious area without their mosquito nets.

In Western Ind. District the rate for malaria has risen from the low record of last year, but can still be considered as satisfactory as being half that of practically all previous years. This decline in cases is attributed to the enthusiastic work of an energetic anti-malarial officer and efficient cantonment and unit malarial squads.

The incidence in this District has been as follows :—

TABLE 15.

	Strength.	Admissions.	Admission rate per 1,000
Quetta—			
1893	2098	2475	1171·12
1894	2219	1919	864·85
1918	3805	1856	490·00
Western Ind. District—			
1933	..	..	204·00
1934	..	..	160·47
1935	..	..	136·10
1936	..	..	103 90
1937	..	..	123·55
1938	..	..	59·20
1939	..	..	68·30

Of the larger stations there were only four with malarial rates greater than the all India rate of 58·1 *viz* : Razmak with 178·3 per 1,000 due to the infections at Razani ; Meerut with 67·3 included in the generally prevalent infection in the U. P. ; Poona at 78·6 and Mhow at 98·2 which shared the prevalence of the Bombay and C. P. areas.

The types of malarial infection by Commands over the past 3 years are shown below. The number of cases which are diagnosed *clinically*, 2·8 per cent. is satisfactory.

TABLE 16.

Comparative diagnoses of Malaria by Commands.

(Percentages.)

Command.	Year.	B. T.	M. T.	Q. T.	Mixed.	Clinical.
Northern	1937	76·42	17.45	0·47	1·41	4·25
	1938	77·45	21·07	..	0·37	1·11
	1939	73·24	23·82	0·21	0·52	2·20
Eastern	1937	84·44	11·94	0·83	0·83	1·94
	1938	79·36	10·78	0·91	3·90	5·05
	1939	74·92	18·95	0·29	1 75	4·08
Southern	1937	65·81	26·13	1·93	3·23	2·90
	1938	64 99	23·43	3·91	5·30	2·37
	1939	65·33	27·86	1·70	2·48	2·63
Western I. District	1937	69·29	27·07	0·40	1·21	2·02
	1938	77·03	14·35	..	0·96	7·65
	1939	68·46	20·13	1·34	4·70	5·37
ALL INDIA	1937	73 00	21·32	0·95	1·80	2·94
	1938	73·67	19·13	1·47	2·77	2·95
	1939	70·73	24·01	0·76	1 63	2·87

The high relative incidence of Quartan infection and mixed infections in Southern and Western Commands compared to the other two areas is interesting. M. T. Infections were 14 per 1,000 in both the former and only 3 and 2 per 1,000 in the latter.

8. Sandfly Fever.

This unpleasant and debilitating condition has shown a distinct rise both for British and Indian troops, a rise of 6 per 1,000 for the former and of 1·3 per 1,000 for Indian; but the sickness therefrom is still well below the pre-1937 period when spraying was seriously introduced.

The cause of this increase has been an epidemic at Agra in the Delhi Brigade Area, where there was a jump of 34 per 1,000, this increase spread to the Lucknow area; a marked increase of nearly 8 per 1,000 in the Rawalpindi District area; an increase in Lahore District chiefly due to 74 cases at Sialkot and Ferozepore during the hot weather and a definite prevalence of the infection in the premonsoon period at Lucknow.

TABLE 17.

Sandfly fever over past 10 years.

Ratios per 1,000.

Year.	British Troops.	Indian Troops.
1930	49·4	12·1
1931	39·4	16·3
1932	40·9	15·2
1933	40·9	10·4
1934	36·2	8·3
1935	36·5	7·5
1936	33·8	10·6
1937	24·6	6·6
1938	24·8	4·6
1939	30·7	6·0

At Agra on the 6th September there was an immense downpour, 15 inches of rain within 2 days which did much damage to mud walls. This was followed by an epidemic of sandfly fever with as many as 50 admissions from military personnel in one day. The Delhi Brigade admission rate jumped 34 per 1,000 to 53·5. Energetic measures were adopted including the spraying of buildings with insecticide and the epidemic ceased as abruptly as it had begun.

In the Lucknow area sandfly fever was very prevalent in the pre-monsoon period and was also noted into P. and A. District. The result of these out breaks was that the sandfly fever admission rate for Eastern Command rose to 35·34 per 1,000.

Rawalpindi District: the rate rose 7·71 per 1,000 to 51, the highest figure for at least 10 years. But for Northern Command as a whole the incidence has been low, though slightly increased on 1938, for the third successive year *i.e.* since spraying campaigns were introduced. The actual admissions have fallen from 1260 in 1931 to 654 in the present year and in Peshawar District, which has been notorious for sandfly fever the admission rate has fallen below 100 per 1,000, *viz.* 93·29, for the first time. The rate for Landikotal at 107 per 1,000 is satisfactory, but the rate in Peshawar itself is considerably higher at 130·8. This improvement is again attributed to the spraying campaign which even at every 4th day is the most potent protective means we have. At 93 per 1,000 in Peshawar District the admissions for sandfly fever have fallen from 17 per cent. of the total admissions for all causes in 1938 to 14 per cent. in the present year.

TABLE 18.

Sandfly fever in Northern Command.

Year.	Admissions Ratio per 1,000.	
1931	72·16	
1932	84·38	
1933	85·58	
1934	80·04	
1935	82·37	
1936	80·37	Spraying campaign was instituted in Peshawar District and taken up gradually in other Districts.
1937	51·15	
1938	47·57	
1939	52·39	

In Southern Command there was little change: of 33 cases 19 came from Bombay and 14 from Jubbulpore.

Western Ind. District, however, in contrast to the previous year shows a decrease of 60 per 1,000 to 54·75 a very much more reasonable figure. It is too soon to shout that our measures are successful but the reduction has been is attributed to:

(*a*) improved housing in the new barracks;

(*b*) destruction and removal of old buildings and rubble;

(*c*) increased efficiency of spraying.

When things go well we are inclined to forget the natural reductions which may occur from climatic and other causes and the periodic decrease in the wave of incidence of all diseases.

It is interesting to note however that a marked or very marked prevalence of sandflies, Phlebotomus papatassii and others, was recorded in several areas including Western District. Phlebotomus was particularly noted in the hill stations of Rawalpindi District, and at Dalhousie but no truly indigenous cases have occurred, a point worth noting in connection with the conclusion reached in this connection in the Sandfly fever Enquiry Report.

The Sandfly fever Enquiry at Peshawar, carried out by an officer of the Royal Army Medical Corps under the auspices of the Director, the King Institute of Preventive Medicine, Guindy, has been brought to a close ; the officer concerned having departed on service. A summary of the report is included in paragraph 64 K.

9. Dengue.

This disease is one of the conditions which appear to show marked annual variations. It appears in epidemic form in certain areas and then appears to die away. In the present year we seem to have encountered the epidemic in P. and A. District and in Lucknow District which has materially influenced the all India figures for British troops.

TABLE 19.

The incidence of Dengue Fever.

Ratios per 1,000.

Year.	Admissions. British.	Admissions. Indian.
1933	11·7	2·1
1934	6·6	2·5
1935	5·0	3·4
1936	4·7	2·5
1937	12·2	5·1
1938	3·9	1·1
1939	9·6	1·1

Cases occurred throughout the year but the curve of incidence showed two peaks ; for British troops in May and August and in August and November for Indian troops.

The following table shows the monthly incidence for both British and Indian.

TABLE 20.

(Percentages).

	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
British	6·59	2·29	2·87	5·73	23·21	11·17	6·88	15·47	11·17	7·74	4·87	2·01
Indian	0·76	2·29	..	6·87	6·11	6·87	10·69	22·90	16·03	7·63	19·85	..

From Table 19 it will be observed that Indian troops do not show the marked variations shown by British. The latter may be specially prone to infection or it may be partly a question of diagnosis. When Dengue is prevalent there is a tendency to diagnose many obscure mild fevers as such. Whereas at other times uncertain cases are labelled cold, pharyngitis, influenza and so on. The presence of a mild, evanescent rash in a two to four day's fever is much more easy to see on the European than on the Indian skin.

In P. and A. District with 288 admissions, it was at Calcutta, where there were 268 cases that the epidemic became most marked. Cases occurred from May to October with 73 admissions in May, but doubt has been expressed by some medical officers as to the correctness of the diagnosis in this small epidemic as in some portions of the period mosquitoes were not remarkably prevalent. In Lucknow there was a similar but lesser influx of cases, both British and Indian.

There was also a small epidemic at Ambala amongst Officers, their families and servants. This was an unusual outbreak and appeared to be limited to certain bungalow areas.

At Lahore too there were some typical dengue cases, 6 were admitted there and one Lahore case in Dalhousie. Aedes egypti were common in Lahore at the time, also albopictus and vittatus.

Five cases were reported from Karachi and of the 45 cases admitted and diagnosed as such in Southern Command 14 each came from Bombay and Madras.

It will be seen therefore that the condition was widespread tending to epidemic proportions in the Bengal delta.

10. Fevers of the Typhus Group.

The total sickness from this Group remains much the same as in 1938 *viz.*, 61 for 1939. British cases have however increased to 30 and Indian decreased to 31, but the total numbers are very small.

The total numbers from all ranks and classes was 73 and again the cases fall into two main groups ; the typhus of the Hills which occurs in the autumn and the Murine typhus (Protens X 19) of the Plains which gives the bulk of the cases (27 out of 73).

The OX 2 group only produced 8 cases and 7 cases were diagnosed as typhus group but unclassified.

TABLE 21.

Incidence of Typhus Fever.

Year.	Actuals. British.	Indian.	Total.
1933	23	19	42
1934	52	51	103
1935	19	45	64
1936	44	47	91
1937	25	43	72
1938	23	36	59
1939	30	42	72

The distribution of the total cases recorded is shown by Commands in the following table.

TABLE 22.

Regional incidence of Typhus Fever by types in 1939.

Type.	Northern		Eastern		Southern		Western		Total		Grand total.
	Br.	Ind.	Br.	Ind.	Br.	Ind.	Br.	Ind.	Br.	Ind.	
OXK . . .	7	7	5	2	7	3	..	..	19	12	31
OX19 . . .	..	11	2	..	3	11	..	..	5	22	27
OX2 . . .	1	1	..	1	2	3	..	..	3	5	8
Unclassified . .	..	3	1	2	1	5					7
Total .	8	19	10	4	14	18	..	..	32	41	73
Total 1938 .	7	29	13	9	9	14	..	..	29	52	81

A short investigation of Typhus fever in the Dagshai Hills from the B. M. H., Dagshai.—The work was undertaken to ascertain whether Trombiculid mites were possible carriers of tropical typhus of the XK type in the Simla Hills. This was undertaken by an Officer of the Royal Army Medical Corps who himself had once been infected in the Simla Hills and been very ill with the disease.

The method adopted was that used in Japan and Sumatra, namely the collection of mites from the ears of rats and subsequent injection of the ground-up mites into guinea pigs. 360 rats were trapped of which 97 were infested.

Mites when present in any numbers appear as orange coloured clusters which are easily seen, the largest number from one rat being 497 and in all 1409 mites were collected. If the mites are required for transfer to other animals the ears of the chloroformed rats are placed in a petri dish until cold and encircled with vaseline to prevent escape of the mites. The mites crawl off and can be removed by a camel's hair brush. For identification, examination under a dissecting microscope is essential. The species identified were *deliensis* and *oudemansi*.

Collection was also made from stockings or socks worn by coolies working in the jungle, with subsequent chloroform treatment to extract the mites, a tedious method; and by light treatment which did not give good results.

Subsequently for the actual test of infectivity the collected mites, sent in moist tubes to the Central Research Institute, Kasauli, were inoculated into guinea pigs but none contracted typhus.

11. Enteric Group of Fevers

For British Troops this Group has unfortunately risen to over 1 per 1,000 below which it had been for the previous two years. The actual number of admissions for the disease however remains very satisfactorily low, under 40, and is half or less that of figures for the preceding years.

Admissions for Indian troops remain remarkably low, at 0·5 per 1,000 of strength.

TABLE 23.

Comparative table of incidence of Enteric Group Fevers over 20 years.

Year.	(Ratios per 1000) British troops.	Indian troops.
1913	2·3	1·6
1919-1928 (Average 10 years)	3·3	0·9
1929	4·2	2·9
1930	3·7	2·3
1931	3·3	2·5
1932	3·4	2·2
1933	3·2	2·5
1934	1·7	1·9
1935	2·0	1·4
1936	1·5	0·6
1937	0·8	0·9
1938	0·9	0·8
1939	1·1	0·5

In Deccan and Madras Districts there have been *no* cases for the second year in succession, but there were 9 cases in all in Southern Command.

Eastern and Northern Commands both record slight increases. In the latter however Lahore District continued to show the previous year's decrease, the rate now being 2·2 per 1,000 with no deaths. In Peshawar District there was an epidemic in the villages surrounding Nowshera and a number of cases in the Saddar Bazzar. Northern Command as a whole showed a slight increase to 1·51 per 1,000 but the total military cases in the Command only numbered 19.

The A. D. H. & P. comments to the following effect. Considering the disease was rife in surrounding villages (Nowshera and Abbottabad) we must conclude that inoculation plus water treatment are the cause and our safeguard, and that this is not due to improved sanitation (other than water). The dysentery incidence which is not affected by either of these preventive measures shows no sign of reduction. The fact that during the year nearly 2,000 British troops were in camps in Waziristan together with Indian Troops, Followers and labourers and that no single case of Enteric occurred speaks well for our control in Military areas.

The only case in Western District was due for inoculation.

The relative proportions of the members of the Enteric Group of diseases is shown by the next table.

TABLE 24.

Comparative Table of Types in the Enteric Group. Actual admissions and deaths.

(Unclassified cases are not shown).

Years.		British troops				Indian troops			
		Typhoid	Para A	Para B	Para C	Typhoid	Para A	Para B	Para C
1935	A	27	13	4	...	55	46	1	...
	D	8	...	...	...	8	3	...	...
1936	A	14	13	1	1	29	14	1	...
	D	2	...	...	...	3	...	...	...
1937	A	6	2	2	...	36	23	...	..
	D	3	...	...	...	6	1	...	...
1938	A	15	2	4	...	38	15	1	1
	D	3	...	...	...	5	...	...	...
1939	A	14	7	2	...	27	16	1	...
	D	1	...	1	...	5	...	...	...

The decrease in the Para. A group noted in 1937 for British troops has not been fully maintained but Indian troops show a further decrease this year.

Paratyphoid A.—Inoculation.—With the reduction in the dosage of T. A. B. to the yearly half cc. the question arose whether the amount of Paratyphoid A vaccine was now sufficient to give immunity. A close watch has been kept month by month on the incidence of Para A fevers during the year. Actually it has been found that there has been no tendency to increase, there being 6 fewer total cases this year compared with 1938.

The influence of the seasons.—The seasonal incidence of the group is similar to last year; but with a tendency to prolong into the autumn, possibly on account of the extension of the warm weather [see paragraph 6 (*a*)]. The monthly figures indicate that some factor connected with the warm-wet months is the cause of many of such of the infections as have occurred, similarly to those for dysentery. The probable factor appears to be fly prevalence with fly borne infection of milk and food.

TABLE 25.

Seasonal distribution per cent. of Enteric Group fevers.

British and Indian Troops.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.
All India	2·7	6·3	5·4	4·5	11·7	8·1	15·3	16·2	16·2	6·3	4·5	2·7

The prevalence of infection in the months of the fly season is strikingly illustrated by these figures.

Enteric Group Carriers.—That these exist even in our midst is a fact which is now often forgotten in our well protected cantonment communities. The presence of such carriers is well illustrated by the following.

B. typhosum was isolated on routine examination from the Head Cook of the R. A. F. Officers Mess at Risalpur. A widal test gave the following results:

TO 240
AO Nil
VI Nil
RV Nil.

But this is only one example out of a number.

Protective inoculation.—T. A. B. inoculation has been satisfactorily maintained and the percentage of those protected is high even though inoculation remains an entirely voluntary procedure. The following table gives the incidence of the Enteric Group fevers amongst all classes both protected and unprotected.

TABLE 26.

Table showing infection rate of Enteric Group Fevers in protected and unprotected personnel.

		Percentage.	Admissions. Typhoid	Para A	Para B	Para C	Enteric group	Total
Officers (B. S. & I. S.)	Protected	96·33	2	..	..	..	3	5
	Unprotected	3·67	1	1	..	..	..	2
Women	Protected	90·00	2	2	..	..	1	5
	Unprotected	10·00	2	..	..	..	..	2
Children	Protected	85·00	2	1	..	..	3	6
	Unprotected	15·00	5	1	..	..	1	7

Inoculation state among B. O. Rs.

Group.	Ratio per 1,000 Cases.	Deaths.	Case mortality per cent.
Protected 99·16 per cent	1·17	0·06	5·26
Unprotected 0·84 per cent	3·53	..	..

The extent to which the Army in India is now immunised by T. A. B. inoculation and protected thereby is illustrated by the plaint of an enthusiastic officer who was endeavouring to carry through research work on the laboratory estimation of anti-bodies produced in fever cases of different types at the hospitals in the District concerned.

He writes:

"The paucity of Enteric among British and Indian troops resulted in a lack of material from that source, but this was more than made up for by the material from uninoculated cases." (Civilian).

12. Dysentery, Diarrhœa, Colitis and Amœbic Hepatitis

In this Group of diseases an entirely different and unsatisfactory state of affairs is shown once more by the incidence for British personnel during 1939. An increase of nearly 3 per 1,000 has taken place although for Indian troops there has been a reduction of 1·4 per 1,000. This is the highest figure for over 20 years.

It is true that this may in part be accounted for, as can all increases this year, by the reduction in strength and the presence of a majority of the unfits of units which had gone ; but comments from Commands and Districts indicate that the high prevalence of dysenteric infection is due to the lack of sanitation which surrounds our troop areas. We have no sure preventive measures such as we have for the Enteric Group, namely inoculation of the individual and purification of the water supplies of the population ; we have to depend on mechanical protection against this fly borne group and the present results show how much we are at the mercy of sanitary or rather insanitary conditions which surround our cantonments. We do not claim that all cantonment areas have perfect sanitation, far from it ; but at least there is evidence of some measure of control in many cantonments and some evidence of a reasonable standard of sanitation in the areas occupied by troops. But comments from Districts show clearly how those troops which are closest to any uncontrolled city or bazaar area outside cantonments suffer from the complete lack of sanitary control which appears to exist therein.

What we need now is some protective measure or device which can be surely applied to each individual, as is our T. A. B. against the Typhoid fevers. No real success has yet been achieved by anti-dysenteric inoculations and at present we have to depend on measures directed against that ubiquitous carrier, the House-fly.

For British troops the present rise in incidence is shown best by the following table and graph. Table 27 shows the admission rates for British and Indian troops over 20 years.

TABLE 27.

The Incidence of the Total Dysentery-Diarrhœa Group.

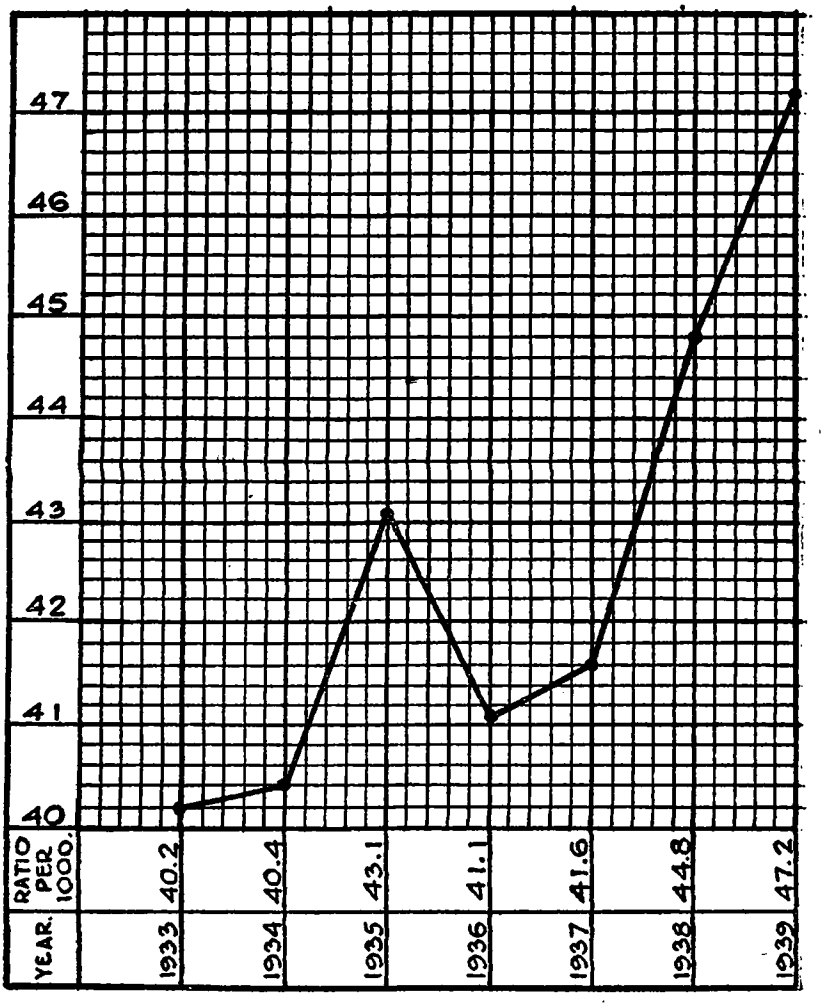
Year	British troops	Indian troops
1913	18·5	25·9
1919	45·3	31·1
1925	24·3	20·3
1929	36·3	24·6
1930	40·5	27·7
1931	43·9	22·6
1932	38·2	21·8
1933	40·2	23·3
1934	40·4	30·2
1935	43·1	17·8
1936	40·7	17·2
1937	41·8	17·9
1938	44·8	24·7
1939	47·2	23·4

It will be seen that there is little tendency to reduction in either British or Indian figures ; such fluctuations as there are being dependent on good or bad years or in other words the climatic effects on the prevalence of the carrier, the Housefly: and yet this is a strictly preventable disease.

The rise during the past few years amongst British troops is illustrated by the graph, No. VI.

CHART No. VI.

DYSENTERY & DIARRHOEA–B.O.Rs.



The all India figure is really made up of two counter-balancing areas, the North and West, with a decrease of admissions during the year and the East and South which by their greater increases have affected the total rate.

In Southern Command there was an increase of 8 per 1,000 and the need for fly proofing of dining rooms and latrines in cantonments is stressed. In Deccan District, with Mhow and Nasirabad as the worst stations the admissions have increased by 4 per 1,000 to the highest for 6 years. Rs. 15,480 have been sanctioned for fly-proofing of latrines in cantonments. In this District to troop movements an increase in infections is attributed, having occurred *en route* and becoming evident by the admission of a number of cases 4 or 5 days after arrival at the new station. In Eastern Command there has been a steady increase over the past 3 years attributed definitely to insanitary conditions and fly borne infection. In Meerut District the dysentery-diarrhœa group has increased in every principal station to the highest seen over 5 years; this is put down as being an infection either through bad sanitation or a water borne infection. As there has been no water supply at fault in the stations concerned it points to bad sanitation and sanitary control as being the essential cause of this increase.

On the other hand in Western Ind. District there has been a decrease in both Quetta and Karachi. There was an outbreak of diarrhœa at a training camp involving 250 men of whom 4 had to be admitted to hospital. Owing to a broken road access was difficult and the cause not traced.

In Northern Command the year shows a decrease of nearly 5 per 1,000 but a ten year survey shows little real evidence of decrease. " This is bound to be so as long as we have no effective immunisation as for Enteric and as long as sanitation remains primitive and conservancy methods remain as they were 35 years ago. Bazar sanitation and excretal disposal shows little signs of improvement outside cantonments and in many cantonment bazaars is primitive. Flies abound, Carriers abound and the infective material is readily available in close proximity to lines. Only the introduction of real sanitation will have any material effect. Modern sewage disposal is expensive ; likewise fly-proofing of latrines and dining places. For British troops the fly-proofing of dining rooms is the most important item."

Peshawar District shows a welcome decrease which is part of a steady decrease from 32 to 11 per 1,000 during the past 6 years. Lahore District also shows a decrease of 6 per 1,000 and Rawalpindi District 3 per 1,000. But here 20 cases were from one unit in which " sanitary endeavour was not up to the mark " ; and 7 cases were infected during train journeys and 4 in camp. There was a mild epidemic amongst families at Cliffden in the Murree Hills.

Carriers ; Chronic cases.—The very obvious connection between chronic cases who are the carriers and fresh cases is well shown by the following examples :—

(*i*) At Lahore in connection with an epidemic of the dysentery-diarrhœa group a chronic case, a fruit hawker, was discovered amongst 27 menials examined.

(*ii*) In a large cantonment 0·07 per cent. of servants were proved as chronic cases to be carriers of dysentery organisms. Amongst these was the head cook of the fashionable hotel at which 50 officers with their wives and children were living.

(*iii*) Two cases of Officers with dysentery were traced as due to direct infection by servants in the hotels in which they were living.

The fly borne nature of infection.—This is shown not only by unanimous opinion of experienced officers but by a study of the seasonal incidence of the disease group in district or station. As an example of the former Poona gives a characteristic series of figures. Of 88 cases in the year, 54 occurred in the 4 months of February-March (27) and July-August (27) the fly months of this area. A majority of the remainder were from camps.

The all India seasonal table also shows this point, but in this vast country there must obviously be local differences in the fly season. As a whole one can say that the fly season is February to April and mid July to late September. This seasonal incidence in a two peak curve is also clearly shown in the graphs of the past 5 years in Chart No. VII.

TABLE 28.

The Seasonal incidence of the Dysentery-Diarrhœa Group.

	British			Indian		
	1937	1938	1939	1937	1938	1939
January . .	1·7	1·6	2·5	0·8	0·6	0·6
February . .	1·5	1·9	2·9	0·4	0·4	0·6
March . . .	3·3	3·7	3·2	0·8	0·7	0·7
April . . .	6·4	6·3	5·4	1·6	2·3	1·7
May . . .	5·0	4·6	4·9	1·8	3·1	3·1
June . . .	2·6	4·7	3·2	1·6	2·9	2·2
July . . .	3·5	6·3	5·3	1·9	3·8	2·3
August . . .	5·3	5·0	6·7	2·9	3·7	2·7
September . .	3·6	2·2	4·2	2·1	2·3	2·4
October . .	2·2	2·7	3·5	1·7	1·7	2·6
November . .	3·7	3·0	3·5	1·7	1·9	2·7
December . .	2·5	1·7	1·9	1·0	1·0	1·5

In reference to fly-borne infection comment is made from Deccan District that increased mechanisation and the consequent reduction in the number of horses will help to reduce the flies in cantonments to some extent, but it is more often in the stable in Officers compounds than in unit lines that fly-breeding is found.

In the 1938 Report a contrast was shown between the dysentery group incidence at Agra, where troops are relatively separate from city or large bazaars, and Jhansi, where a large bazaar, a city and the notorious municipal trenching grounds are in close proximity to Lines. Once again the incidence in this fly infested area is double that of the relatively free Agra area although strengths and general climatic conditions approximate.

TABLE 29.

Dysentery and Diarrhœa at Jhansi and Agra.

	Ratios per 1,000			
	Jhansi		Agra	
Year	British	Indian	British	Indian
1936	43·3	27·3	28·4	29·4
1937	91·5	28·4	22·7	6·7
1938	64·4	49·1	35·5	16·7
1939	83·1	41·0	41·7	28·9

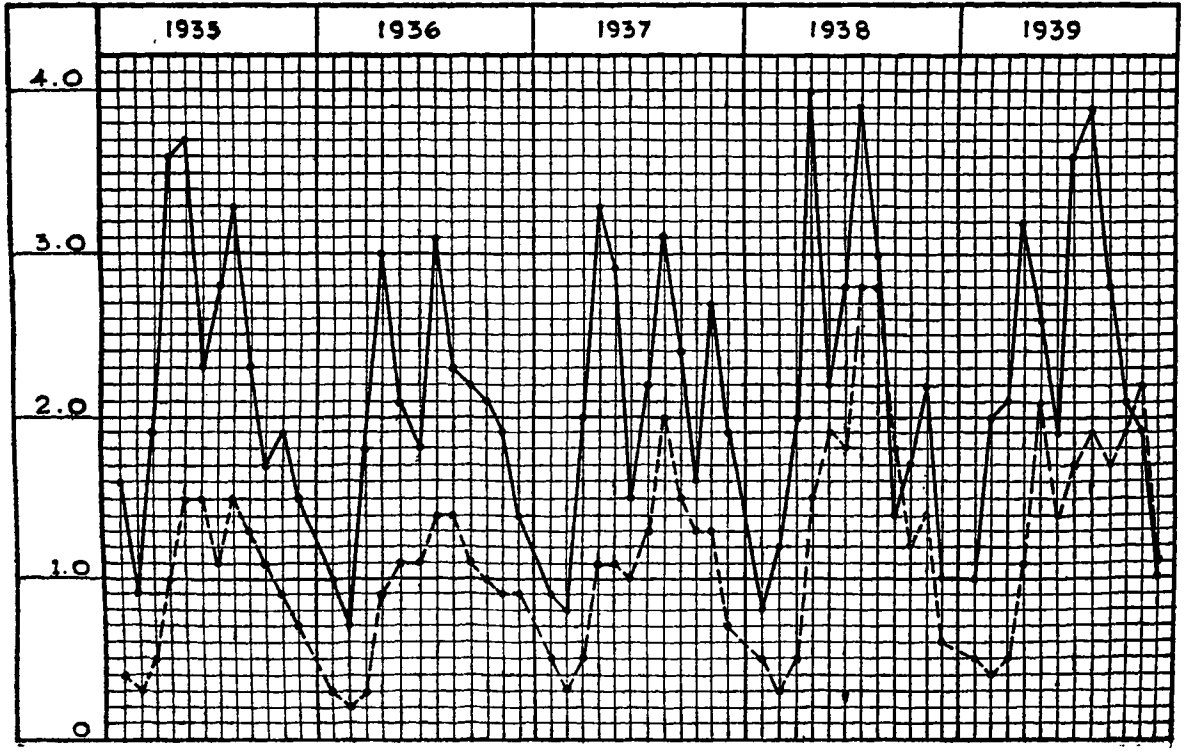
CHART No. VII.

DYSENTERY, ALL INDIA.

BRITISH TROOPS = ———

INDIAN TROOPS = - - - -

MONTHLY ADMISSION RATIOS PER 1000 OF STRENGTH.



It was hoped that the Municipal trenching grounds at Jhansi would be moved at the end of the year. No action to this effect has been successful and the Municipal authorities do not appear to be willing to make any improvement in the sanitation of areas under their control.

Fly infestation with its high dysenteric consequence will therefore remain unabated.

The relative incidence of the whole Dysentery group is of interest also in showing the decline of the amoebic type of infection compared with the fly-borne bacillary type. It will be noted that amœbic hapatitis, liver abscess and colitis are well below 1 per 1,000 and show a decreasing tendency while the fly-borne *preventable* bacillary dysentery and diarrhœa show no tendency to decrease but assume, considerable proportions.

TABLE 30.

The incidence of Dysentery, Diarrhœa, Colitis and Amoebic Hapatitis.

Ratios per 1,000.

	Dysentery	Diarrhœa	Colitis	Total	Amœbic Hapatitis	Liver Abscess
1933 . . .	24·9	15·3	1·0	41·2	0·65	0·13
1934 . . .	25·5	14·9	0·8	41·2	0·96	0·09
1935 . . .	29·2	13·9	0·4	43·5	0·46	0·08
1936 . . .	24·6	16·5	0·9	42·1	0·29	0·04
1937 . . .	25·5	16·1	0·3	41·9	0·23	0·06
1938 . . .	26·8	18·0	0·2	45·0	0·53	0·07
1939 . . .	29·0	18·2	0·6	47·8	0·69	0·06

The distribution of the four disease types by Commands shows that Bacillary cases remain high, protozoal cases remain steady at a reasonably low figure, while cases diagnosed " bacillary exudate " show a gratifying decrease in each Command.

TABLE 31.

Dysentery by Commands for the years 1937-38-39.

Command	Bacillary	Bacillary exudate	Protozoal	Clinical	Total
Northern . .	8·6	3·4	1·9	7·2	21·0
	11·5	2·8	1·5	5·4	21·1
	10·2	2·6	1·8	4·5	19·0
Western . .	11·2	6·7	1·5	8·5	27·3
	18·7	6·0	1·7	16·2	42·5
	7·8	4·1	0·5	9·2	21·5
Eastern . .	15·8	4·2	3·6	5·5	29·0
	16·4	4·1	5·5	3·8	29·8
	23·9	3·2	4·5	5·6	37·2
Southern . .	13·5	7·0	2·8	2·3	18·5
	12·1	7·2	3·9	2·4	25·6
	22·9	3·6	2·2	5·4	34·1

The percentage of types shown below indicates clearly that a common standard of diagnostic procedure is carried out successfully in all Commands and variations are within narrow limits, clinical and exudate cases continue to decrease steadily as bacteriologically proved cases increase.

TABLE 32.

Percentage diagnosis of dysentery-diarrhœa group.

	1935	1936	1937	1938	1939
Dysentery Protozoal . .	10·3	10·8	10·4	12·7	9·1
Dysentery Bacillary (proved) .	41·5	46·1	49·3	51·3	61·6
Dysentery Bacillary (exudate) .	23·0	22·4	19·6	17·4	10·9
Bacillary clinical . . .	25·3	20·7	20·7	18·5	18·4

13. Cholera

As an aftermath of 1938 Cholera was wide-spread, reaching epidemic form in the east and centre of India [see paragraph 6 (*c*)]. In spite of disturbed conditions, in spite of garrisoning security posts in unhealthy isolated areas and in spite of many unusual moves by train and road throughout the year, although there were a number of alarms of cholera in cantonments, there were *NO* cases amongst British troops in 1939 and only two civilian cases in cantonments, Lucknow Cantonment.

14. Disease of the Digestive System.

The admission rate for this group of diseases has again risen appreciably *viz.* by 10 per 1,000 to the considerable figure of nearly 124 per 1,000.

1936	103·1 per 1,000.
1937	99·4 per 1,000.
1938	113·6 per 1,000.
1939	123 5 per 1,000.

This follows closely the rise in the general Dysentery group and as far as the intestinal infections go is dependent on similar causes namely disturbed conditions, much travelling and camping also probably the earlier return from Hill stations.

Tonsillitis which is included in this group shows a satisfactory reduction of over 200 cases but is still 3rd on the list of principal diseases. Both catarrhal jaundice and gastritis show appreciable reductions during the year ; the former 28 cases less and the latter 80 cases. Pharyngitis however which is one of this group produced a substantial increase of nearly 100 cases.

The increase in digestive diseases does not in any way seem to be connected with the increased ration allowance as was feared by one medical specialist in the previous year.

An outbreak of intestinal trouble, acute diarrhœa and vomiting with 71 cases affected of which 27 showed blood and mucous, occurred in a training camp on the Hab River in Western Ind. District. Reports indicated that the trouble was not a fly-borne infection of any kind but was probably due to silicate crystals in the local water supply. Heavy dust clouds may have aggravated the condition.

An exactly similar outbreak had occurred two years previously which was remedied by supplying water from Karachi. This outbreak resembles that reported from Ghariom Camp in 1937 in which deposites of mica and silicate crystals were found in the water from one particular source

15. Cysticercosis, Epilepsy and the Worm Infections

Cysticercosis.—There was again only one case of this distressing disease but curiously enough from the same neighbourhood as the Lahore case last year *viz.* at Amritsar. The details are briefly as follows:

Private D. M. who was of Indian domicile was enlisted into a British Regiment in India in 1935. In 1936 he was for the first time admitted to hospital and diagnosed Epilepsy. At that time complete X-ray examination was undertaken with negative results.

He was again admitted to hospital in 1939 having suffered from fits. On this occasion X-ray examination revealed the presence of calcified masses in the calf muscles of both legs, and left upper arm, no subcutaneous nodules were palpable. He was invalided to the United Kingdom and further information concerning the progress of the case is not at present available.

The following case is worth recording:

Cysticercosis in a dog.—The dog developed fits and on being shot by the owner was found to be infested with cysticeri containing scolices of T. solium. This appeared to be a true case of cysticercus cellulosae of the dog, which though often found to pass lengths of the tapeworm (T. solium) never becomes a true definitive host.

Epilepsy.—There was only one case invalided during this year compared with 11 the previous year, but 6 cases of N. Y. D. convulsions were invalided from Southern Command. None of these appeared to resemble a case of cysticercosis.

There were in all 4 cases of epilepsy amongst British troops and 41 cases from Indian troops during the year.

Tape-worm infections.—Amongst British troops, cases of infection with T. saginata and T. solium have shown a general decrease over the past three years.

Decrease or increase during the year.

	T. saginata.	T. solium.
1937	—2	+3
1938	—9	—16
1939	—64	+8

The prevalence of tape-worm infestation in beef supplies both in Western Ind. District and in Southern Command have again been noted during the year.

Amongst Indian troops there has been an increase of cases both of T. saginata, 5 cases increase, and T. solium, 2 more cases; the numbers are however not great probably only because Indian troops do not report sick with such infections.

Worm infestation.—Considerable attention has however been paid to this amongst recruits of the Indian Army. Numerous investigations have shown a high rate of infestation. Hookworm infestation in numbers varying from 39 to 87 or even 93 per cent. "*Deworming*" of Recruits has therefore received attention and mass treatment is stated to have produced most satisfactory results in the general physical and mental improvement subsequently achieved by these recruits. This is a method of improvement in physique which should be widely adopted throughout recruit training centres.

16. Oriental Sore.

There was an increase of 16 cases of cutaneous Leishmaniasis amongst British troops. The relative figures for the past 5 years are shown below.

Increase or decrease of Oriental Sore.

Year	British troops	Indian troops
1935	+2	—36
1936	+27	+105
1937	—22	—37
1938	—4	—49
1939	+16	+41

It will be noted that considerable fluctuations of indefinite character occur annually, depending presumably on the sandfly prevalence of each particular year in conjunction with moves of salted and fresh troops from and to infested areas.

At Quetta, where the condition has received much attention and preventive measures such as spraying with insecticide, protection of infested sores from access to sandflies and the general removal of builders rubble (see paragraph 8) have been carefully carried out and the two main nullahs have been bricked, the number of cases has markedly decreased this year.

TABLE 33.

Incidence of Oriental Sore in Quetta Cantonment.

	British troops	Indian troops and followers	Total
1936	63	448	511
1937	36	165	201
1938	53	391	444
1939	19*	205	224

* NOTE.—That the British unit only arrived in November 1938 and any real crop of sores are not likely to appear until the spring of 1940.

Northern Command produced 5 scattered cases. The bulk of British cases came from one British Regiment in Bombay District (14 cases) but infection was not local.

The following observation by the D. A. D. P. Western District is worth recording: "It is interesting to note that since 1936 I have only seen one case of an oriental sore on the face of an adult European female. Boys and girls are equally affected on the face. Ladies are mostly infected round the arms and legs. It appears that the powder and cosmetics used by ladies have a repellant effect."

17. Minor Septic and Local injury Group.

This combined group as before produces a very large number of admissions with high rates of temporary inefficiency. For British troops admissions show a decrease of 574 but the total is still nearly 5,000 in the year. Indian troops

however show an increase of 458 admissions with a total nearly up to 11,000 cases. In addition there are the numerous cases retained under Barrack treatment.

It is likely that something could be done by close supervision of all cases in their early stages, but the very nature of military training and particularly of any frontier operations tends to produce large numbers of such cases.

In Northern Command this group always produces large numbers of admissions. In the present year there is a substantial increase of nearly 20 per 1,000 to 135·11 per 1,000. A ten year table shows that the rate rarely drops below 120 per 1,000.

The total inefficiency caused by this group is summarised in the following table.

TABLE 34.

Minor Septic and local injury over the past 10 years.

Ratios per 1,000.

	British Troops			*Indian Troops*		
	Minor septic	Local Injury	Total	Minor septic	Local Injury	Total
1930 . . .	52·7	58·9	111·6	25·6	38·3	63·9
1931 . .	59·0	61·7	120·7	30·0	41·2	71·2
1932 . . .	56·2	58·5	114·7	30·4	43·7	74·1
1933 . . .	58·1	60·2	118·3	32·7	48·2	80·9
1934 . . .	57·9	62·3	120·2	17·5	49·0	66·5
1935 . . .	59·7	62·2	121·9	35·3	53·1	88·4
1936 . . .	59·5	61·8	121·3	33·4	52·6	86·0
1937 . . .	54·6	57·6	112·2	31·4	52·0	83·4
1938 . . .	59·2	62·7	121·9	33·4	58·7	92·1
1939 . . .	66·9	63·0	129·9	36·8	57·0	93·8

Cellulitis still retains second place as a single cause of admission to hospital and in spite of a reduction of 107 cases the rate for the year has increased from 45·2 of 1938 to 51·1 this year.

Boils which have shown a slight reduction of recent years now show a rise in rates for both British and Indian troops.

TABLE 35.

The incidence of Boils.

	British	Indian
1936	9·1	6·0
1937	7·3	5·4
1938	7·7	5·8
1939	8·2	7·5

Local injuries, which include sprains, abrasions, contusions and open injuries, taken as a whole accounted for nearly 450 less British admissions than in the previous year. There were 3 more deaths than in 1938 but 10 more than in 1937.

Resin Poisoning.—The question of resin poisoning in Gymnasia was raised. This is a definite trouble unless precautions are taken ; hands become cracked and septic with the repeated use by many, of one apparatus and much application of resin. Cleansing of hands and liquid disinfection of the apparatus is recommended.

18. Venereal Diseases.

These diseases which gave an increase of 3 per 1,000 the previous year, have again shown a further increase of 8·9 per 1,000 to 52·4 per 1,000. The admission rate is now 19 per 1,000 more than it was 7 years ago. The position is most simply shown by the following chart VIII.

The amount of inefficiency produced by these diseases is certainly a disturbing feature and more so in that this appears to be on the increase and is likely to go still further during the war period. The following extracts from comments by Hygiene Officers are worth recording but still do not get away from the need for serious attention to preventive measures.

" We bring out young men in the prime of life to India. We devote all our attention to keeping them fighting fit, with plenty of spare time and then afford them no femine society of their own class. No wonder they succumb to temptation."

" The more one considers the question the more one is convinced that V. D. is one of the few diseases for which the patient is entirely responsible himself, and in which the medical profession are most helpless. Whatever precautions are enforced and whatever prophylaxis is offered the final court of appeal is the man himself who can nullify all these measures by just ignoring them."

The loss of man days through these diseases can be taken to be approximately as follows over a 5 year period for British troops.

	1935.	1936.	1937.	1938.	1939.*
Days lost from duty . .	87,673	79,759	84,516	72,328	51,465

It should be remembered however that there have been reductions of strength which account for the reduction shown above.

The worst stations in India for V. D. are shown in the following table.

TABLE 36.

Station.	Ratio per 1,000.
Hyderabad	113·9
Cawnpore	109·4
Jullundur	97·6
Barrackpore	88·8
Jubbulpore	83·9
Madras	80·9
Karachi	80·2
Poona	77·5
Secunderabad	75 6

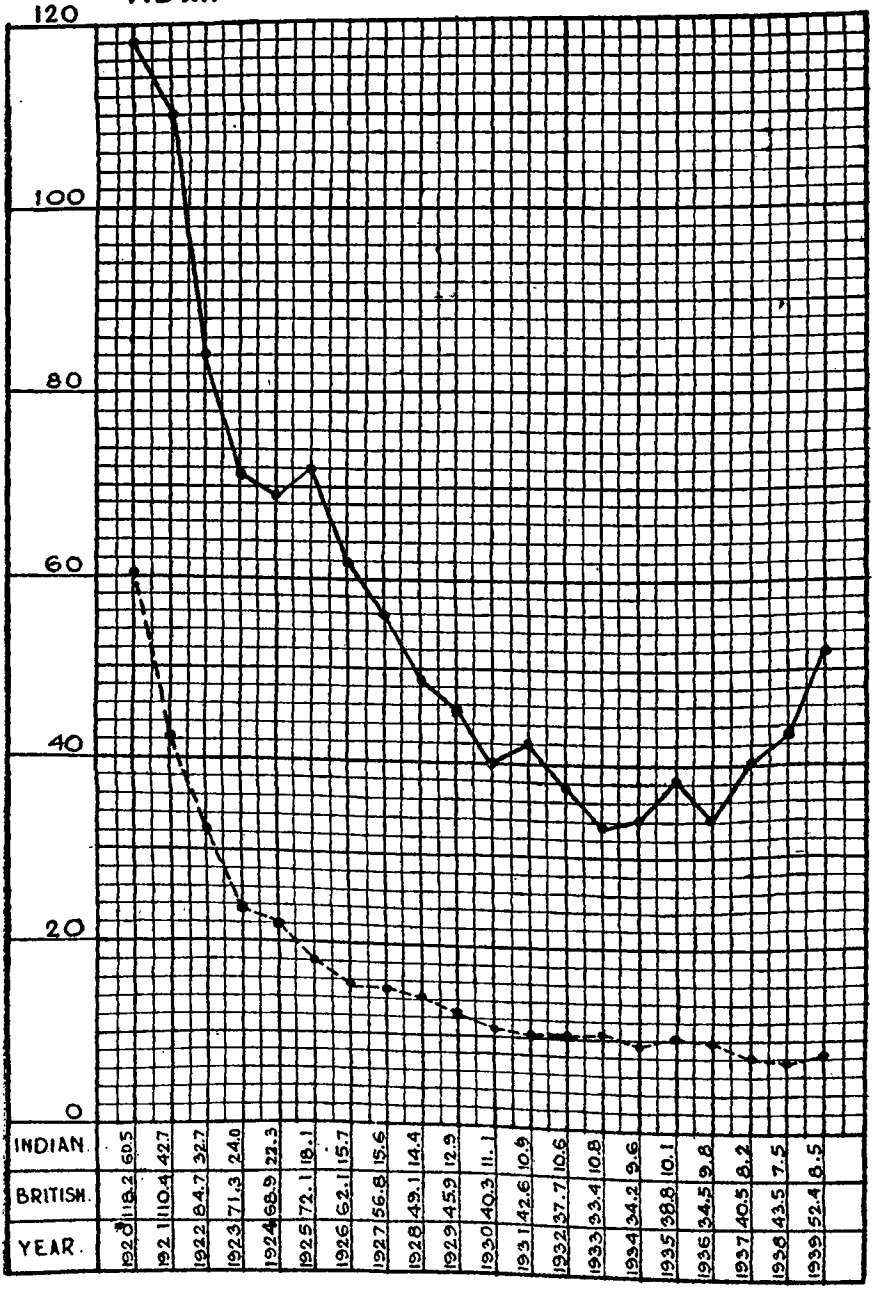
CHART No. VII.

BRITISH ——

INDIAN – – –

VENEREAL DISEASES.

ADMISSION RATIO PER 1000 OF STRENGTH.



YEAR.	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
BRITISH.	119.2	110.4	84.7	71.3	68.9	72.1	62.1	56.8	49.1	45.9	40.3	42.6	37.7	33.4	34.2	38.8	34.5	40.5	43.5	52.4
INDIAN.	60.5	42.7	32.7	24.0	22.3	19.1	15.7	15.6	14.4	12.9	11.1	10.9	10.6	10.8	9.6	10.1	9.8	8.2	7.5	8.5

TABLE 36—*contd.*

Station.	Ratio per 1,000.
Lucknow	73·5
Ferozepore	73·1
Bombay	68·7
Lahore	66·3
Calcutta	64·0
Wellington	61·0
Agra	60·8
Bangalore	58·8
Meerut	56·8
Bareilly	56·1
Delhi	52·8

NOTE.—In 1938 there were only 13 large stations in which the rate was over 50 per 1,000; This year 20 stations.

Three areas show a decrease in cases and rates, *viz.*: (*i*) Western District (Quetta and Karachi): (*ii*) P. and A. District where the ratio has fallen by 15 per 1,000 to 53·36, the lowest since 1934; Calcutta shows a drop of 44 per 1,000 while Barrackpore, Dinapore and Port Blair show lesser decreases: (*iii*) Bombay which has an unenviable reputation for venereal but the admission rate fell by 25 per 1,000. As these are all large town areas the question immediately arises is this reduction due to local civilian treatment of cases.

That there is a marked difference between stations because of the idiocyncrasies of different units is well shown by the Field Regiments R. A. at Secunderabad. The one present in 1938 had 4 cases of V. D. whereas the one present in 1939 produced 33 admissions.

Increases are shown by all the other Command figures.

In Northern a slight increase of 2 per 1,000 to 37·4, there being no tendency to decrease over the past decade and the past three years being the worst. In Southern a large and regrettable increase of 13·1 to 65·5 per 1,000; admissions for Syphilis and Soft chancre have increased whereas Gonorhoea has decreased. Does this mean much increase in local private treatment with the Sulphopyridine group of drugs? In Eastern too there has been steady regrettable increase of 11·1 to 55·0 per 1,000; the rate being higher than the all Indian rate. In contrast to P. and A District mentioned above Lucknow District shows a well marked rise of 20 per 1,000 giving the highest rate for 5 years: this was due to the Battalion which came from the Frontier to Cawnpore and produced 50 admissions.

The problem remains a difficult and disappointing one. There are a variety of probable causes:—

(*i*) One is undoubtedly the restless feeling induced by the War and frequent moves and arrivals of units to new stations.

(*ii*) At the outbreak of war there was a very definite shortage of "Preventive packets" to which is attributed some of the cases of the disease. These packets have been available at a scale of 1 per man per year. This may be sufficient in out-stations but in towns where temptations are many and frequent the scale is obviously ridiculously inadequate. No limit of this type should have been placed on the free issue of these packets. They have now been arranged for on an as required scale.

(*iii*) The presence of ample facilities and temptations leading to infection, with a lack of social amenities and European companionship outside barracks during long years of service is undoubtedly one of the causes.

(*iv*) The new drug treatment is also having an effect. This can be obtained readily from local practitioners at a cost very small compared with the penalties inflicted on the unfortunate man who acquires the disease and presents himself for official treatment. The very presence of this drug for the treatment of Gonorrhœa may induce a relaxation of the average man's fear of the disease and its consequences. This knowledge of the effects of Sulphanilamide drugs is said to have a definite influence. Troops now believe that they can be readily cured without ill effects should they become infected. The result is a decrease in certain areas of admissions for frank cases of Gonorrhœa and an increase in cases of urethritis without the infecting organism being present. In addition we have the added danger of over dosage with a dangerous drug. On the other hand, the bright side of this picture is the remarkable shortening of hospitalisation which has resulted from the use of these drugs in treatment; a reduction of hospitalization from 64 days to 18 or even 14 or 12 days.

(*v*) Preventive ablution rooms are maintained in all units, well equipped and staffed reasonably well. But considered opinion states that certainly 50 per cent. or even 80 per cent. of the men who are infected have never made any attempt to use the facilities provided. Experienced Officers assert that a simple thorough washing with soap and water in reasonable time will be effective as a preventive measure. This is available at P. A. Rooms but is not used by the majority of those who acquire infection.

A senior hygiene officer with experience of the methods employed in the U. S. A. Army points out how effective are their far more drastic measures but is of opinion that methods as drastic would not be acceptable to the British Army.

The problem of venereal disease and its prevention is undoubtedly serious and needs the attention of all officers particularly those in immediate command of troops. The considered opinion of an experienced battalion commander is worth quoting from Rawalpindi.

"I am of the opinion that the increases in admissions to hospitals on account of venereal disease are due to three main causes in so far as the unit under my command is concerned.

(1) The change of station from ....., where little facilities existed for contracting this disease, to Rawalpindi where soldiers are encouraged by tonga drivers and others to visit brothels.

(2) The removal by the War Office of the 6 months forfeiture of proficiency pay and the substitution of three months. I stated last year that I believed this measure would have this result and I hoped it would not be brought in. Although I do not suggest that men take risk merely because the penalty is reduced, I do believe that the general opinion is that the military authorities now are not so anxious as they were that venereal disease should not exist.

(3) The various increases in pay and reduction of expenses which enables soldiers to go out of barracks far more often than formerly."

The relative proportions of the diseases of the venereal group are shown in the following table.

TABLE 37.

Venereal diseases for 7 years by groups.

Ratios per 1,000.

		Gonorrhœa.	Syphilis.	Soft chancre.	Total venereal diseases.
1933	B. O. Rs.	23·2	4·9	5·0	33·4
	I. Os. & I. O. Rs.	4·7	3·9	2·2	10·8
1934	B. O. Rs.	25·2	4·5	4·1	34·1
	I. Os. & I. O. Rs.	4·2	3·5	1·9	9·6
1935	B. O. Rs.	25·8	6·0	6·8	38·8
	I. Os. & I. O. Rs.	4·6	3·7	1·8	10·1
1936	B. O. Rs.	25·7	4·1	4·6	34·4
	I. Os. & I. O. Rs.	4·8	3·4	1·6	9·8
1937	B. O. Rs.	28·4	5·8	5·7	40·5
	I. Os. & I. O. Rs.	3·4	3·0	1·7	8·1
1938	B. O. Rs.	28·0	7·6	7·9	43·5
	I. Os. & I. O. Rs.	2·9	3·1	1·5	7·5
1939	B. O. Rs.	32·7	8·4	10·2	52·4
	I. Os. & I. O. Rs.	3·4	3·4	1·2	8·5

The contrast between admissions from British and Indian troops is very marked, but does not necessarily mean a similar absence of actual infection. The difference in the proportion of admissions for Syphilis and for Gonorrhœa in the two is also significant, suggesting that Gonorrhœa to the Indian is hardly worth reporting whereas Syphilis requires full treatment or that mercury cream is used by the British and aborts a proportion of Syphilis infections without affecting those of Gonorrhœa.

The seasonal variation of these diseases over the past 5 years is given by Chart No. IX which shows the annual rise in the post holiday period and the rise after movements of troops has been taking place and the rise after the outbreak of War.

19. Scabies.

This preventable disease continues to cause unnecessary admissions to hospital. The numbers have fallen by 4 this year.

In Eastern Command there has been little change, 19 cases. In Rawalpindi District there was a satisfactory reduction, one case instead of 13 as last year.

TABLE 38.

Scabies. Ratios per 1,000

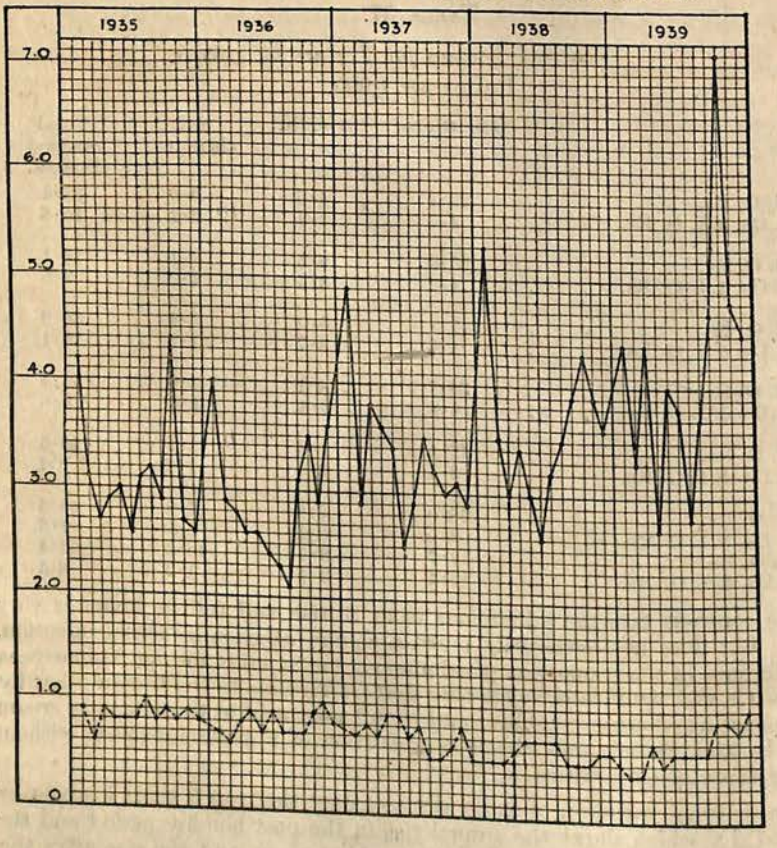
	B. O. Rs.	I. O. Rs.
1935	1·4	9·6
1936	1·7	7·7
1937	1·4	7·7
1938	1·9	10·2
1939	2·2	11·9

CHART No. IX.

VENEREAL DISEASES, ALL INDIA.

BRITISH TROOPS = ——•
INDIAN TROOPS = •------•

MONTHLY ADMISSION RATIOS PER 1000 OF STRENGTH.



20. Small pox

The protective state acquired by vaccination remains at a satisfactory level. Forgetfulness is still a case of neglect of this simple precaution.

Owing to the period of 3 years being the limit of protection after vaccination allowed by Port Health authorities in places out of India an amendment was issued to our own vaccination rules for all troops proceeding abroad. Orders were issued that all officers and troops proceeding abroad must have been protected by vaccination not less than 12 days or more than 3 years at the time of reaching the port of disembarkation.

TABLE 39.

Half yearly state of vaccination of British troops and families.

	Percentage protected.	
	On 30th April.	On 31st October.
British Officers	99·81	99·52
British Other Ranks	99·91	99·28
Women and Children	99·70	97·32

There was a reduction of 6 cases of smallpox compared with the previous year. British other ranks produced cases at Delhi, Meerut, Cawnpore and Sialkot but there were no deaths. There were no cases amongst British Officers and their families and there was only one case in B. O. Rs.' wives at Meerut.

This is all the more remarkable in view of the marked prevalence of smallpox in many areas of the country [see paragraph 6 (*b*)]. For example at Ambala there was a small epidemic in the Railway colony, 67 cases and 11 deaths, but there were no British cases in the station.

21. Cerebrospinal Fever.

There were only 3 cases, one of which died at Meerut, the recovery cases were at Razmak and Jubbulpore.

Special attention was directed to the likelihood of cases occurring when the Relative Humidity was rising. Little such correlation was observed but climatic changes are often very localised and perhaps not accurately recorded. From previous experience there is an obvious correlation.

There was an increase of 9 cases amongst Indian troops, the majority in Northern Command.

22. Poliomyelitis.

With only 3 cases this infection does really very little damage even in our susceptible populations. In 1938 there were 6 cases. It is the dramatic onset and high mortality which draws public attention to this disease.

Amongst Indian troops there were 2 cases in lieu of none of the previous year.

The British cases were at Rawalpindi and Peshawar in June and Lucknow in September; the Indian cases were at Poona and Quetta in July and August.

Owing to the fame which has been achieved by the use of the "Iron Lung" much attention has been directed to this condition although it is relatively unimportant. For comments on the " Iron Lung " see paragraph 66 (viii).

23. Respiratory Diseases.

The slight increase in the rate per 1,000 of the past 5 years has been maintained giving a steady rise during these years for all three types of the main respiratory group. Whereas Indian troops have shown an almost similar decrease. The British increase has been more apparent than real in that there has been a reduction of nearly 50 actual admissions.

With a decrease in Northern and Eastern Commands the slight general rise is due to increases in Southern Command.

There have been no epidemics to account for this except for very localised outbreaks labelled " Influenza " in Southern Command. There were 111 cases of Influenza admitted, but a note is made to the effect that nearly all are from seaport towns at a time when Dengue was prevalent.

In Madras District there were 34 admissions for Influenza immediately after the arrival of a fresh British Battalion and finally there were 46 cases from British troops and 11 from Indian troops.

The influence of the Sulphapyridine group of drugs in the treatment of these cases has been commented on as being one of the outstanding features of success.

TABLE 40.

Respiratory Diseases by types.

Ratios per 1,000.

	Diseases of bronchi and broncheoles.		Diseases of larnyx and trachea.		Pneumonia lobar and lobular.	
	B. O. Rs.	I. Os. & I. O. Rs.	B. O. Rs.	I. Os. & I. O. Rs.	B. O. Rs.	I. Os. & I. O. Rs.
1934 . . .	14·8	15·0	1·0	1·0	3·9	6·0
1935 . . .	15·5	11·9	1·2	1·0	4·2	4·9
1936 . . .	16·8	11·9	0·8	0·9	3·5	5·4
1937 . . .	17·2	13·3	1·3	0·9	3·2	5·2
1938 . . .	18·2	12·7	1·3	0·7	3·3	5·0
1939 . . .	19·3	14·0	1·8	0·9	4·7	2·8

These rates per 1,000 for British troops each showing a slight increase represent an actual reduction of nearly 50 cases owing to the general reduction in strengths during the year.

There was, however, an increase of 61 cases of pneumonia compared with the preceding year but the deaths were only 5 compared with 10 of the previous year. This definite increase in pneumonia is due to admissions in Southern and Northern Commands. In Eastern Command there was a definite decrease in the disease, noted as being one of the few bright spots of the annual résumé ; but in Southern there were 30 cases with no deaths and in Northern there was a sharp but not extensive increase. It is interesting to note that in Waziristan, where British troops were either in Razmak, at 7,000 feet, or in camp at Razani at 5,000 feet the pneumonic rate was the lowest in the Command at only 1·10 per 1,000.

Lobular Pneumonia and Pleuresy with 91 cases between them remained at the usual figure. Bronchitis gave us 87 cases less than in 1938 and there were *NO* cases of Empyema.

The monthly admissions for the pneumonic group are shown below.

TABLE 41.

Monthly incidence of Pneumonic Group—for 1939.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Lobar Pneumonia—												
B. O. Rs. . .	29	11	5	6	10	10	10	8	8	12	10	18
I. Os. & I. O. Rs. .	103	45	46	35	31	28	18	14	24	44	35	90
Lobular Pneumonia—												
B. O. Rs. . . .	3	3	4	2	2	1	...	2	1	1	...	4
I. Os. & I. O. Rs. .	17	12	11	9	5	8	4	3	7	5	15	15

The total influenza admissions showed a reduction of 235 cases on the previous year and tonsillitis and pharyngitis, which should be included in this group rather than under digestive diseases, showed a reduction of 127 cases Tonsillitis has increased steadily in Eastern Command for the past 3 years.

24. Tuberculosis.

There was a decrease of 11 cases of pulmonary type but 5 more non-pulmonary during the year. In part this is due to the departure of certain units in which cases had previously been recorded.

During the year records by units were checked to ascertain whether any direct connection could be traced between cases in one station or in one group of barracks or in one particular unit. Although it is obvious that there must be connection between cases in certain units which produce several cases a year, the length of time before symptoms become manifest combined with frequent moves of individuals and companies makes it impossible to trace any direct connection in the average case.

In Eastern Command there was a definite increase to 14 cases of pulmonary type, the highest being P. and A. District. In Northern Command on the other hand there has been a further decrease in the disease down to 0·72 per 1,000, a satisfactory feature as this is the lowest figure recorded.

Table No. 42 shows that as far as military populations are concerned there is no steady increase in the disease which appears to be occurring amongst the civilian population of India.

TABLE 42.

Incidence of Tuberculosis amongst British and Indian troops over a 6 year period

(Ratios per 1,000.)

Year.	British troops.	Indian troops.
1934	1·1	2·1
1935	1·3	2·4
1936	1·3	2·0
1937	1·4	2·0
1938	1·2	2·1
1939	1·3	2·2

25. Diphtheria.

There has been a continued increase in this disease to 64 amongst British personnel making a continued rise over the past 3 years, a marked contrast to the cases amongst Indian troops which have again only 2 admissions for the year.

TABLE 43.

Admissions for Diphtheria over 6 years (Ratios per 1,000).

	British Troops.	Indian Troops.
1934	1·2	0·1
1935	1·3	0·0
1936	1·3	0·1
1937	0·8	0·0
1938	1·2	0·1
1939	1·8	0·0

This is due to increases in Southern and Eastern Commands whereas in Northern the rate has decreased to the low figure of 1·04 per 1,000.

The general incidence is best shown by the following table:—

TABLE 44.

Diphtheria by Commands in categories.

British service.

	Northern Command.	Western (I.) Dist.	Eastern Command.	Southern Command.
Officers and Other Ranks	14	..	31	29
B. O. Rs. wives	1	..	2	2
B. O. Rs. children	15	..	3	17
Total 1939	30	..	36	48
Total 1938	38	13	18	59

In Northern Command three special centres of infection are noted. In Lahore District, 11 cases in all, 4 came from a camp at Malot, the first case being *cutaneous diphtheria*. At Sialkot also *cutaneous* cases were reported, 2 virulent and others non-virulent and 7 Nursing Orderlies temporarily harboured K. L. B. in their throats. In the Simla Hills at Sabathu there were 15 cases amongst British children also one woman and one N. C. O. contact developed the disease a month later. For this outbreak T. A. F. immunisation was given to the whole child population. Several of those recently immunised developed the disease. This point is worth recording in that parents need to be warned when T. A. F. immunisation is being undertaken that the immunity therefrom takes time to develop.

In Eastern Command there was a small sharp epidemic amongst the men of the Field Regiment R. A. at Meerut with extensions during the summer and autumn to Dulikhet and Lucknow. There were also sporadic cases at Bareilly and Chakrata.

In Southern Command 8 cases came from Wellington and 10 from Madras, here also obviously interconnected outbreaks. This is the second time in 6 years that there has been an epidemic in this area.

26. Effects of Heat.

There has been a satisfactory reduction in cases and even better reduction in deaths which are usually high in this group. The slight increase in Heat Exhaustion in recent years is partly due to the greater tendency to diagnose this condition in mild cases of general malaise in the hot weather months.

This absence of any marked increase in the Effects of Heat for British personnel is all the more satisfactory in that the whole of the hot weather months saw frequent moves of troops by rail and road, the manning of unusual defence posts and a premature return of British troops from Hill stations to the Plains.

TABLE 45.

Effects of Heat.

	Heat stroke.		Heat exhaustion.	
	Cases.	Deaths.	Cases.	Deaths.
1936	13	3	39	1
1937	15	6	37	2
1938	22	6	65	6
1939	13	2	67	2

Eastern Command is the area which shows an increase of Heat Exhaustion, 16 cases with 1 death, 13 of these occurred in Lucknow. There was however a decrease in Heat Stroke, 5 cases with 1 death. In Southern there were only 2 cases all told with 1 death in Bombay.

In Northern Command the rate reduced to 3·1 per 1,000 but the 1938-39 period is well above normal. This was due to 10 cases in Rawalpindi which included one elderly Warrant Officer, the only serious case, who was taken off the train in a collapsed state. Deaths this year have been exceptionally low, 1 out of 39 cases or 2·7 compared to 14·29 per 1,000 of 1938.

The value of increased *salt* intake which was stressed in our 1938 report was shown at Cawnpore where the hot weather was long and trying with record temperatures but a low relative humidity. The value of increased salt consumption in the prevention of heat-stroke was stressed. Only one case of Heat Exhaustion was admitted. There were other cases with slight temperatures but they were not dealt with as cases of "Heat".

In a large station in Peshawar District a patient for Gonorrhoea developed heat-stroke in hospital and died rapidly. He was shown to be a chronic alcoholic (8 pints of beer and much whisky daily) with typical alcoholic stomach and liver. His heart showed the typical wooden heart of heat-stroke.

The seasonal incidence of Heat Stroke and Heat Exhaustion are shown below.

TABLE 46.

Seasonal incidence of Heat Effects. (British Troops).

	Jan.		Feb.		Mar.		Apr.		May.		June.		July.		Aug.		Sep.		Oct.		Nov.		Dec.	
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
Heat stroke.									3	..	2	1	4	..	1	1	1	..	..	..	..	..	..	..
„ exhaustion									4	..	18	2	15	..	8	..	6	..	2	..	..	..	..	..

27. Mental Diseases.

For British Troops the steady decrease of recent years has been continued, the numbers admitted being the least shown for the past 6 years. Invaliding although showing a reduction of 9 cases is still over 50 for the year.

Nearly 30 per cent. of the admissions were for Hysteria and of these only 9 were invalided.

TABLE 47.

Admissions for Mental Diseases.

	British Troops.		Indian Troops.
	Admissions.	Invalided.	Admissions.
1934	2·8	1·23	1·0
1935	3·3	1·01	0·8
1936	2·8	1·88	0·9
1937	2·5	1·54	1·0
1938	2·5	1·51	0·9
1939	2·9	1·60	1·3

28. Other Diseases.

Cerebral Abcess.—A case was admitted and died of a cerebral abcess the size of a golf ball in the temperosphenoidal lobe of his brain. The abcess with walls 5 millimeters thick contained sterile pus. He had carried out his full duties to within 10 days of his death without any signs of this serious condition.

Hydrophobia.—Unfortunately there were 2 cases both at Ranikhet; one was a R. A. M. C. Orderly who refused treatment although warned, because he wished to be in time to sit a Corps examination. The other did not report until symptoms developed.

Jaundice.—Many cases occurred in all Districts. Total admissions numbered 257. Investigations have been repeatedly carried out over the pass 15 years to try to find a cause, but invariably the conclusion is reached that the Jaundice is of the *simple catarrhal type.* A number of cases occurred during the summer at Sialkot and the Medical Officer concerned commented that the occurrence of cases is at such intervals as to fit the view that the Jaundice is infective.

Kala-azar.—There were 2 cases amongst B. O. Rs.

One in the Simla Hills at Kasauli in the B. I. Regiment and in the British Infantry unit stationed at Barrackpore. The Calcutta man was admitted twice.

29. British Drafts for the Trooping Season, 1939-40.

The total strength of newly arrived men from Great Britain and from stations overseas was somewhat lower than in pre-war years.

3·2 per cent. were found to be temporarily unfit on arrival in this country but after necessary treatment all were rendered fit.

12 men were found to be permanently unfit. The causative diseases were visual defects, hernia, bilateral rigid flat foot, pulmonary fibrosis and sclerotic periostitis.

302 men were found to be unprotected against the enteric group and 876 men had not been vaccinated against smallpox. With present conditions of service being what they are vaccination against smallpox and enteric are voluntary. Practically all these men consented after persuasion by their

medical officers both to be given T. A. B. and to be vaccinated. The attention of the War Office was drawn to this, particularly to the fact that on persuasion practically all the men consented to be done. Steps were taken at Home to rectify this matter.

A group of 8 men who were noted from Southern Command to weigh under 112 lbs. on enlistment were placed on special reports; a follow-up showed that they have now gained satisfactorily in weight.

The following list shows the principal disease from which young British soldiers suffer during their first year in the country.

TABLE 48.

Details of principal causes of sickness in soldiers under 20 years of age.

Dysentery-Diarrhœa	140
Tonsillitis, inflammation of fauces and pharyngitis	131
Minor septic diseases	123
Other diseases of the skin	109
Local injuries	102
Other digestive diseases	65
Malaria	65
Diseases of ear and nose	53
Venereal diseases	38
Sandfly fever	31
Jaundice	20

ROYAL A

30. Invaliding.

Although slightly reduced in the present year, partly due to alterations in shipping and the disturbance of War, the rate has remained remarkably level for British and for Indian troops: varying from 7 to 11 per 1,000 for the former and 9 to 5·5 per 1,000 for the latter.

TABLE 49.

Invaliding.

Ratios per 1,000.

	British other ranks.	Indian other ranks.
1930	8·70	6·23
1931	9·76	8·73
1932	7·39	6·47
1933	9·15	5·68
1934	9·39	5·62
1935	6·90	5·54
1936	10·99	5·52
1937	10·97	5·49
1938	9·35	5·84
1939	9·14	6·43

The principal diseases for which British other ranks were invalided are shown below.

TABLE 50.

Invaliding British Troops.

	Per 1,000.
Mental diseases other than Schizophrenia	1·28
Pulmonary tuberculosis	1·03
Diseases of joints	0·58
Injuries other than fractures	0·47
Fractures	0·42
Schizophrenia	0·28
Diseases of bronchi and bronchioles	0·28
Diseases of urinary organs	0·25
Diseases of valves of the heart	0·25
Deformities of limbs	0·19
Tuberculosis other than pulmonary	0·14
Rheumatic fever	0·06
Epilepsy	0·03
Disordered action of the heart	0·03

31. Deaths.

The death rate at 2·75 per 1,000 shows a slight decrease on the previous year and the death rates over the quinquennial periods since the War 1914-18 show a steady decline to 2·54 per 1,000.

In Southern Command there were only 17 deaths compared with 29 of 1938 and this is first time for many years that the death rate has fallen below 2 per 1,000. There were two unusual deaths, a B. O. R. who was mauled by a tiger near Deolali and another who was killed in shallow water by a shark at Madras.

One British soldier is considered to have died of Heat Stroke at Mount Abu but the cause of death was uncertain as he died alone when lost from his walking party in the hills.

In Waziristan the deaths increased to 19 but 15 of these were due to gun shot wounds.

The principal causes of death were :

	Per 1,000.
Local injuries including G. S. W.	0·78
Infectious diseases	0·58
General injuries	0·39
Digestive diseases	0·36
Circulatory diseases	0·19
Pneumonia	0·14

32. Officers, British Service.

Special remarks and diseases.

As noted in paragraph 2, the admission rates for Officers has increased for the last 3 years and stands at 435·1 per 1,000. This increase is due to rising admissions in Northern and Eastern Commands, Western Independent District and Southern Command showing definitely decreased rates.

In Northern Command there has been a jump of 90 to the year's rate of 497·01 per 1,000. This actually is about normal for the Command except in the " low " years 1937, 1938. This is due chiefly to Lahore District where the rate increased to 521 per 1,000 due to similar causes as for the Troops. The death rate has, however, decreased and, at 1 only, is lowest for 8 years. Kohat District is noteworthy in having an exceptionally low sick rate at 375 per 1,000 in spite of the long trying hot weather which was experienced there.

Eastern Command, though less in actuals, shows some increase in the admission rate. There was considerable Dysentery in Meerut, and Dengue and Sandfly fever in Lucknow District. There were 3 deaths in young officers including two young R. A. M. C. officers, one of poliomyelitis and one of tuberculosis.

Southern Command shows a reduction in sickness, 6 per 1,000 and no deaths. Dysentery at 52 per 1,000 was the most prominent feature and also minor septic diseases.

Western Independent District too showed a marked drop in admissions, the actuals being halved and the rate reduced by 200 per 1,000. There were no invalids and no deaths.

The D. A. D. H. remarks:

"It is undoubtedly a fact that Officers particularly are paying more attention to protecting themselves and their men from malaria, sandflies and the pollution of food by flies."

The principal causes of sickness amongst Officers were as follows:—

TABLE 51.

	Per 1,000.
Malaria	36·8
Dysentery	36.8
Jaundice Catarrhal	29·9
Cellulitis	26·2
Sandfly fever	25·1
Tonsillitis	20.8
Diarrhœa	19.8
Fractures	11.2
Common cold	8·5
Contusions	8·0
Influenza	7·5
Appendicitis	6·9
Concussions	5·9
Sinusitis	5·3

It is worth noting how prone Officers appear to be to Jaundice.

PART I

SECTION II

ON THE HEALTH OF INDIAN ARMY.

SECTION II

ON THE HEALTH OF INDIAN ARMY

33. General

The health of the Indian Army has on the whole been satisfactory. There have been no epidemics of any note and such increase as there has been, *viz.*, 32·2 per 1,000 in admission rates can be fully accounted for by conditions of war service.

Large numbers of reservists returned to their units, there was a considerable influx of recruits and many defensive posts had to be manned in relatively unhealthy areas.

Death rates have decreased to 2·12 per 1,000 and invaliding has increased to 6·43 per 1,000.

The average constantly sick figure has increased to 16·25.

TABLE 52

General health statistics of the Indian Troops in India during the year 1939. Ratios per 1,000 of strength

	Admissions.	Deaths.	Invalids sent to United Kingdom.	Invalids discharged in India.	Constantly sick.
Officers . . .	462·1	3·84	12·36	...	14·75
Indian Other Ranks .	454·0	2·12	...	6·43	16·25
Followers . . .	323·2	2·50	...	4·23	11·45
Others* . . .	2321	17	...	86	...

* Includes Reservists, Indian Territorial Forces, Royal Indian Marine, Indian States Forces, R. A. F., Civilians and Pensioners.

N.B.—The figures below the horizontal line represent actuals.

The health statistics of Officers and Indian Other Ranks for the quinquennial periods from 1925 are shown in the following comparative tables.

TABLE 53-A

Quinquennial comparative table of sickness for Officers and Other Ranks. Ratio per 1,000.

Period.	Admissions.		Invalids.		Deaths.	
	King's Commissioned Officers.	Indian Ranks.	King's Commissioned Officers.	Indian Ranks.	King's Commissioned Officers.	Indian Ranks.
1925-29 . .	498·0	385·6	5 22	10·8	4·74	3·48
1930-34 . .	336·7	453·3	12·47	6·55	5·37	2·63
1935-39 . .	383·8	423·3	10·72	5·76	6·05	2·08

TABLE 53-B

Annual comparative table of sickness for Officers and Other Ranks. Ratio per 1,000.

Period.	Admissions.		Invalids.		Deaths.	
	King's Commissioned officers.	Indian ranks.	King's Commissioned officers.	Indian ranks.	King's Commissioned officers.	Indian ranks.
1935 . . .	346·8	422·7	6·82	5·54	7·31	2·15
1936 . . .	364·3	426·5	5·34	5·52	4·37	2·16
1937 . . .	359·0	391·7	9·23	5·49	4·35	1·77
1938 . . .	**386·8**	**421·8**	**19·86**	**5·83**	**10·40**	**2·21**
1939 . . .	462·1	454·0	12·36	6·43	3·84	2·12

34. Officers

The admission rates for officers which has shown a steady upward tendency for the past 10 years is this year again conspicuous for a rise of nearly 80 per 1,000 but is still below the quinquennial figure for 1925-29 but the rates for invaliding at 12·36 per 1,000 and for deaths at 3·84 per 1,000 have decreased.

The increase in admission rates is due partly to the return to India of a number of retired and in many cases elderly officers after the outbreak of war and partly to the arrival of a number of very junior officers without experience of life in East.

The principal causes of sickness were as follows :—

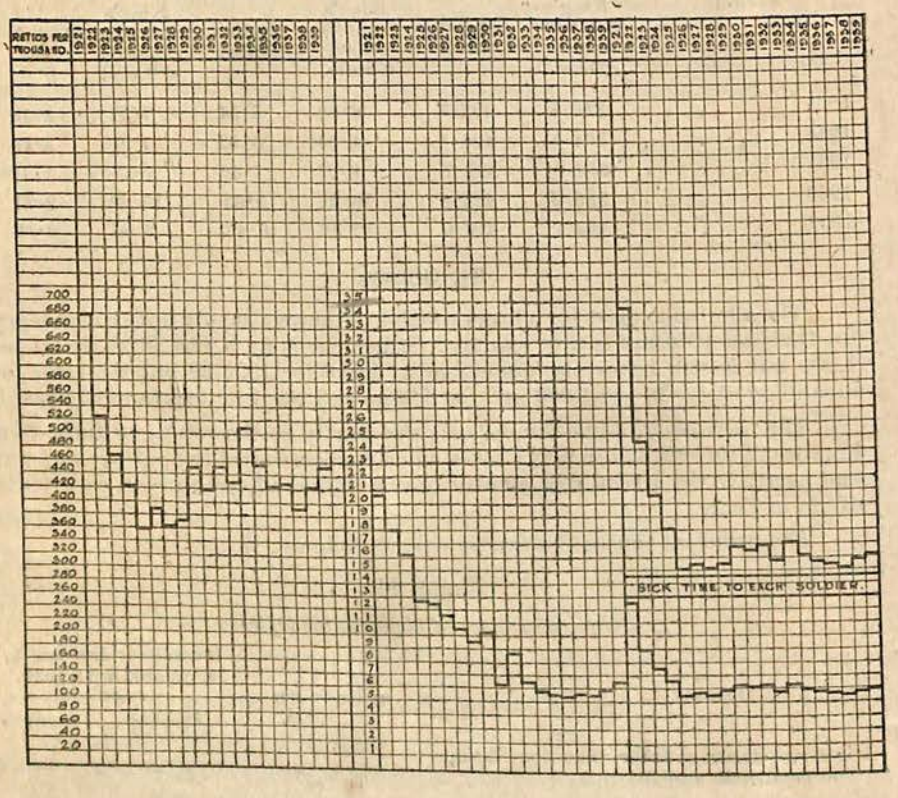
TABLE 54

Principal causes of sickness for Officers

Diseases.	Ratio per 1,000.	Increase or decrease as compared with 1938. Increase.	Decrease.
Digestive diseases other than tonsillitis, appendicitis and diarrhœa . . .	75·0	27·2	..
Local injuries	57·1	8·9	..
Malaria	37·9	..	2·8
Minor septic diseases	24·7	3·4	..
Sandfly fever	22·6	3·2	..
Ear and nose	20·9	8·6	..
Diarrhœa	20·9	5·3	..
Tonsillitis	20·5	5·4	..
Dysentery	15·8	..	13·5
Respiratory diseases	16·6	..	5·1
Appendicitis	14·9	3·6	..
Diseases of bones, joints, muscles, fasciae and bursae	14·9	2·1	..
Influenza	11·9	4·3	..
Urinary diseases	10·2	1·7	..
Common cold	8·1	0·1	..

CHART No. X.

Ratios per 1,000 Admitted to Hospital, Invalids, Constantly sick, and average sick time to each soldier from 1921 to 1939. (Indian Troops.)



Of the total deaths 4 were due to injuries, a cause which as usual heads the list of causes of deaths. Of the remaining, deaths due to sickness the diseases were : Haemorrhagic meningeal effusion, Aneurysm, Bronchitis, Nephritis and Carcinoma, each 1 case.

35. Soldiers

There has been a marked rise in admission rates, nearly 33 per 1,000 to 454·0, a rate higher than any shown by the past quinquennial periods.

This increase is due in greater part to four main preventable diseases, *viz.*, malaria, dysentery, scabies and sandfly fever. In all of these diseases and in many others shown in the table below any relaxation of disciplinary control and laxity in the recognised measures of prevention will produce an increased number of cases. This has been in part, the cause of this year's increase and is due to the disturbing influence of the onset of war, unusual journeys, overcrowding in barracks, manning of defensive posts scattered throughout unhealthy areas away from the protection of cantonment life, increased training and other activities. But is also due to the importation of infected personnel in the form of Reservists called up from their villages, numbers of recruits infected before acceptance and auxiliary troops arriving from civilian life.

The principal causes of admissions to hospital were :—

TABLE 55

Principal causes of admission

Diseases.	Ratio per 1,000.	Increase or decrease as compared with 1938. Increase.	Decrease.
Malaria	118·3	8·6	..
Local injuries	57·0	..	2·8
Minor septic diseases	36·8	2·7	..
Pharyngitis	24·1	4 8	..
Dysentery	17·1	..	0·1
Common cold	15·7	4·1	..
Bronchitis	13·2	0·8	..
Scabies	11·9	0·7	..
Venereal diseases	8·5	1·0	..
Conjuctivitis	7·3	1·0	..
Mumps	7·0	2·3	..
Diarrhœa	6·3	..	1·2
Ankylostomiasis	6·2	1·9	..
Sandfly fever	6·0	1·4	..
Tonsillitis	5·5	..	0·6
Pneumonia (lobar and lobular)	5·4	0·4	..
Dermatitis	5·1	1·3	..
Indigestion	4·5	..	0·7
Constipation	4·0	1·4	..
Tineas	3·8	..	1·0
Influenza	3·7	..	0·7
Otitis media	3·4	0·4	..
Synovitis	3·1	0·1	..
Myalgia	2·9	0·3	..
Jaundice catarrhal	2·8	1·1	..
Eczema	2·4	..	..
Anaemia secondary	2·2	0 3	..
Appendicitis	2·1	3	..
Trachoma	2·1	0·2	..
Pulmonary tuberculosis	1·9		

TABLE 55—*contd.*

Principal causes of admission

Diseases.	Ratio per 1,000.	Increase or decrease as compared with 1938. Increase.	Decrease.
Rhinitis	1·8	0·4	..
Piles	1·8	..	..
Pleurisy	1·7	..	0·6
Dracontiasis	1·6	..	0·2
Coryza	1·5	0·1	..
Colic	1·5	0·1	..
Lumbago	1·4	0·3	..
Measles	1·3	..	0·4
Renal colic	1·3	0·1	..
Chicken-pox	1·3	0·4	..
Gastritis	1·2	0·1	..
Sciatica	1·2	..	..
Keratitis ulcerative	1·2	..	0·1
Dengue	1·1	..	..
Otitis externa	1·1	..	0·1

The death rate shows a decrease of 0·09 per 1,000, the rate now being 2·12 per 1,000 and the fall shown over the past 15 years has been steadily maintained. "Injuries" with over 70 deaths again heads the list of causes and produces more than double the number caused by the dreaded pneumonia.

Injuries and pneumonia between them produced four more deaths than all the other causes put together. The principal causes of death were :—

TABLE 56

Causes of death for Indian Troops

Diseases.	Ratio per 1,000.	Increase or decrease as compared with 1938. Increase.	Decrease.
Local injuries	0·63	0·09	..
Pneumonia (Lobar and lobular)	0·29	..	0·14
General injuries	0·16	0·08	..
Circulatory diseases	0·15	..	..
Digestive diseases	0·13	..	0·06
Nervous diseases	0·10	0·04	..
Pulmonary tuberculosis	0·06	..	0·06
Enteric group of fevers	0·06	..	0·01
Meningococcal infection	0·04	..	0·03
Tuberculosis (other than pulmonary)	0·04	..	..
Dysentery	0·04	0·01	..
Malaria	0·04	..	0·01
Urinary diseases	0·03	..	0·01

Invaliding.—The invaliding rate at 6·43 per 1,000 is 0·60 more than last year and 0·12 less than the rate over the past 14 years. The rate now is half of that of the quinquennial period 1925-29.

The main diseases for which invaliding was necessary are shown below.

TABLE 57

Principal causes of invaliding for Indian Troops

Diseases.	Ratio per 1,000.	Increase or decrease as compared with 1938	
		Increase.	Decrease.
Pulmonary tuberculosis	1·70	0·27	..
Injuries	1·08	..	0·43
Diseases of the bones, joints, muscles, fasciae and bursae	0·53	0·19	..
Mental diseases	0·48	0·11	..
Diseases of the nervous system	0·38	0·01	..
Diseases of the eye	0·36	..	0·02
Diseases of the respiratory system	0·34	0·16	..
Diseases of the Digestive system	0·27	0·20	
Other tubercular diseases	0·21	0·03	..
Diseases of the Circulatory system	0·16	0·02	..
Diseases of teeth and Gums	0·11	0·10	..
Diseases of ear and nose	0·09	..	..
Diseases of urinary organs	0·07	..	0·03
Diseases of blood	0·07	..	..
Venereal diseases	0·04	..	0·01

It will be noted that once again Tuberculosis heads the list, pulmonary tuberculosis accounting for nearly 200 of the cases and the total tubercular diseases again form nearly 1/3 of the total cases invalided.

The average number of constantly sick in hospital was 16·25 per 1,000 of the strength compared with 15·78 in 1938 and 15·15 in 1937.

The average sick time to each soldier was 5·93 days and the average duration of each case was 13·06 days compared with 5·76 days and 13·65 days of 1938.

Men under barrack treatment (out patients) were 1,296·5 per 1,000 compared with 1,229·9, 1,219·1 and 1,343·3 of 1938, 1937 and 1936, respectively.

The combined ratio of constantly sick in hospital *plus* those constantly under treatment in barracks was 34·60 per 1,000 compared with 33·22 in 1938, 33·00 in 1937 and 34·93 in 1936. This represents the total loss per 1,000 pe day.

These statistics show that the health of the Indian Army has on the whole been reasonably satisfactory throughout the year although the admission rate of 454·0 per 1,000 is in excess by 32·2 over that of last year.

All Commands show an increase in sick rates with Malaria and Sandfly fever being the chief causes. In W. I. District there was an increase of 60 per 1,000 due to malaria and sandfly fever. In Eastern Command the sick rate, though not so adversely affected as in the case of British Troops, at 455·3 per 1,000 gives the highest rate for 6 years, sandfly fever, malaria and dengue being the causes. Southern Command too has produced increases due in the main to malaria of which there were 2,416 admissions compared with 1,609 of the previous year. There was a good deal of overcrowding in Bombay at one period.

In Northern Command, where there was a general increase of 19 per 1,000, a curious feature was the contrast between Lahore and Waziristan districts with higher rates and the other three districts, Kohat, Peshawar and Rawalpindi districts with the lowest sick rates ever recorded. The general decrease

in malaria and sandfly fever was partly offset by increases in mumps, pharyngitis and ankylostomiasis. In Waziristan district in spite of operations in the Shaktu Valley in February and March with cold, rain and snow and prolonged columns the general health has remained good. Kohat district with a reduction of 75 per 1,000 in sickness has the healthiest year for 4 years. In Peshawar district with still further reductions the admission rate at 353 per 1,000 is the lowest for at least 15 years ; there were only 19 cases of malaria, 1 of sandfly fever and 1 of venereal diseases per 1,000 of strength. In this district the progressive fall in insect borne diseases is of interest.

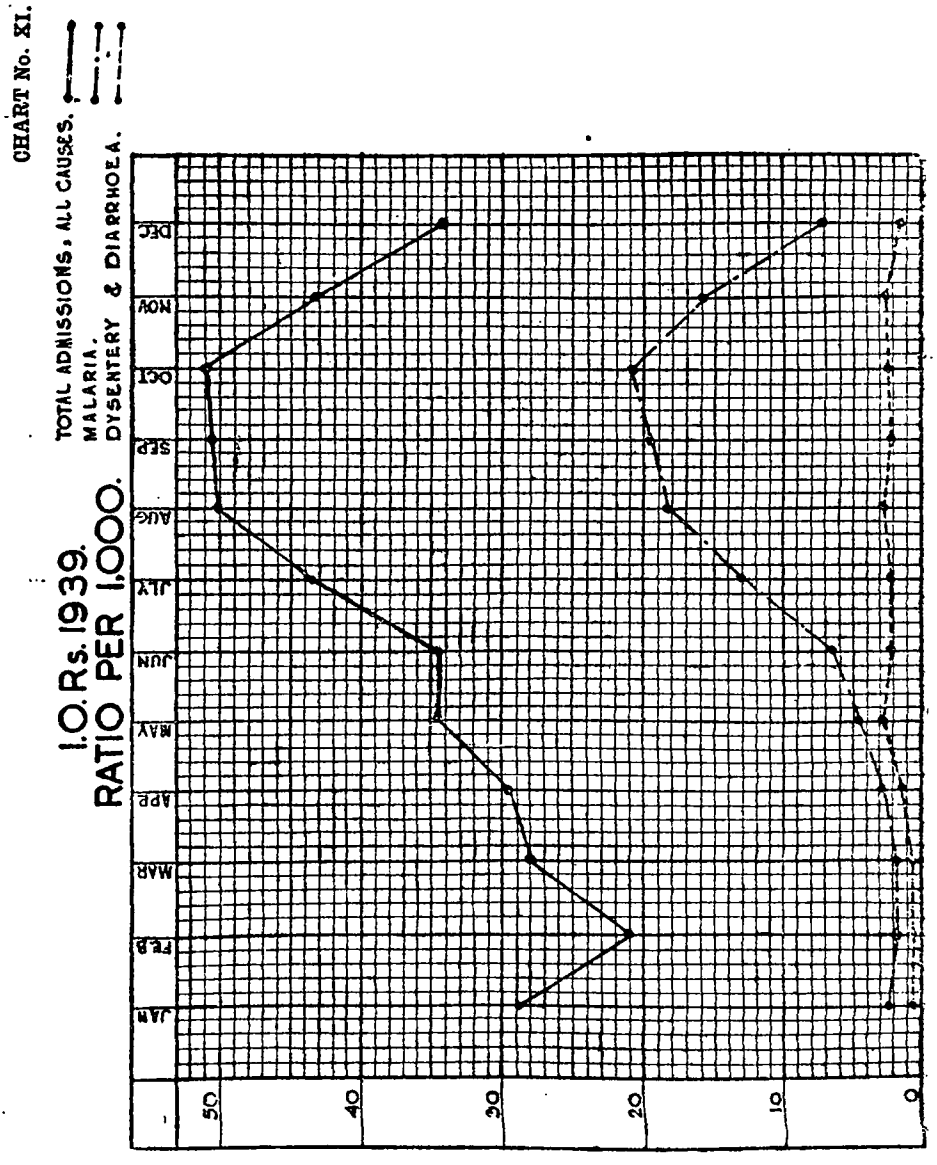
	1934.	1935.	1936.	1937.	1938.	1939.	
Insect borne disease group . . .	50·6	39·6	47·9	30·0	30·1	25·6	per cent of the total admissions.

From Rawalpindi district the following observations are recorded. From the 1st September onward all the factors which tend to increase sick rates were operative, reservists were called up in large numbers, recruits arrived in batches, Territorial battalions were raised and leave men were recalled from and through malarious areas. The sanitary discipline of these was naturally not so good as it is in the trained troops. Men were undergoing intensive training, there was some overcrowding and many outposts and security points were manned.

In spite of all these factors the sick rate was lower this year compared with 1938 and would have been better still but for these abnormal activities after war was declared.

Barrack treatment and high rates of sick.

The remark is noted from reports that of all the factors given to account for high sick rates in barracks, the personality of the medical officer is one of the most important. Frequent changes of medical officer, the presence of newly joined, ignorant medical officers and soft hearted elderly medical officers are all conducive to specially high sick-rates in the medical inspection rooms.



The peak of the sickness curve for all India was in October. The peak in Commands was in August in Northern, Eastern and Southern Commands; but in Western Independent District was in July and in Southern Command there were two peaks in April and August.

The graph given below shows more clearly the general trend of sickness through the year.

TABLE

Table showing total admissions and deaths ratios per 1,000 of the strength for with all

Stations.	Mir Ali.	Dehra Dun.	Razmak.	Jubbulpore.	Bannu.	Ambala.	Fort Sandeman.	Jhansi.	Poona.	Meerut.
	Stations with total admission ratios all causes, higher than									
All Causes :—										
Admissions	812·1	688·3	652·2	639·1	607·5	557·9	531·7	513·4	511·7	507·4
Deaths	8·21	4·04	4·47	...	6·23	1·25	2·31	1·32	2·90	0·89
A. C. Sick.	14·85	25·15	24·76	22·40	22·90	16·74	15·15	18·22	19·16	19·68
Malaria :—										
Admissions	290·8	177·7	190·9	180·7	159·7	155·6	199·3	99·4	178·2	174·0
Deaths	...	...	0·17	...	...	...	...	...	...	...
Sandfly fever :—										
Admissions	47·3	...	2·2	1·6	7·4	...	17·1	2·6	...	...
Deaths	...	...	...	...	...	...	...	...	...	...
Enteric group :—										
Admissions	...	1·5	0·3	...	0·3	0·4	1·4	0·3	...	0·9
Deaths	...	0·37	...	..	...	...	0·46	...	...	...
Dysentery :—										
Admissions	12·6	15·1	30·8	26·7	24·8	16·7	3·2	35·3	17·9	14·3
Deaths	...	...	...	...	0·28	...	...	...	...	...
Diarrhœa :—										
Admissions	5·8	10·7	3·3	4·0	8·8	7·1	2·8	5·6	5·3	9·4
Deaths	...	...	...	...	...	...	...	...	...	...
Influenza :—										
Admissions	0·5	13·6	1·0	...	...	...	0·9	10 2	...	...
Deaths	...	...	...	...	...	...	...	...	...	...
Pneumonia Lobar and Lobular :—										
Admissions	5·3	5·5	3·0	3·0	8·2	7·5	5·1	3·0	4·5	6·3
Deaths	...	0·73	0·50	...	0·57	0·42	...	0·33	0·53	...
Venereal Diseases :—										
Admissions	2·4	7·0	4·0	13·4	7·6	7·5	2·8	3·0	21·8	13·4
Deaths	...	...	...	...	...	...	...	...	...	...
Minor Septic Diseases :—										
Admissions	23·7	94·7	32·1	70·8	38·8	51·4	24·9	50·2	34·2	39·8
Deaths	...	...	0·17	...	...	...	...	...	...	...
Local Injuries :—										
Admissions	69·6	73·4	74·7	86·6	75·0	66·9	45·8	86·9	63·2	69·4
Deaths	8·21	0·87	3·15	...	4·53	...	0·92	...	0·26	...
Heat Stroke :—										
Admissions	...	...	...	...	...	...	...	...	...	...
Deaths	...	...	...	...	...	...	...	...	...	...
Heat Exhaustion :—										
Admissions	...	...	...	...	...	...	...	...	...	...
Deaths	...	...	...	...	...	...	...	...	...	...
Ankylostomiasis :—										
Admissions	4·8	5·1	5·5	7·9	20·1	22·6	0·5	...	6·3	0·4
Deaths	...	...	...	...	...	...	...	...	...	...
Pulmonary Tuberculosis :—										
Admissions	0·5	1·1	1·3	1·5	2·8	0·4	0·9	1·7	1·8	4·0
Deaths	...	...	0·17	...	...	...	...	...	0·53	0·45

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all causes and certain important diseases for the large stations compared India.

all India.	Stations with total admission ratios all causes, lower than all India.											
Nowshera.	Lahore.	Abbottabad.	All India.	Rawalpindi.	Kohat.	Bangalore.	Secunderabad.	Wana.	Quetta.	Landikotal.	Peshawar.	Jhelum.
475·9 1·24 12·48	472·2 1·60 16·17	464·2 2·29 14·26	454·0 2·12 16·25	433·9 0·71 19·59	419·6 1·00 16·76	414·2 3·00 17·67	387·9 1·88 13·56	360·3 1·71 15·84	357·1 1·43 19·44	344·7 0·98 10·57	329·1 2·16 14·08	264·1 0·40 8·26
69·7 ...	144·9 ...	122·5 ...	118·3 0·04	103·6 ...	107 1 ...	20·4 ...	40·5 ...	83·4 ...	118·8 ...	123·2 ...	70·5 0·18	127·4 ...
22·7 ...	2·4 ...	1 0 ...	6·0 ...	6·4 ...	6·2 ...	... ...	... ...	0·7 ..	17·9 ...	11·2 ...	14·9 ...	2·8 ...
0·9 ...	0·4 ...	1·0 ...	0·5 0·06	0·2 ...	0·8 ...	... ...	0·6 ...	... ...	0·2 ...	0·5 ...	0·4 0·18	0·4 ...
8·7 ...	12·4 ...	4·9 ...	17·1 0·01	28·9 ...	13·4 ...	14·4 ...	25·7 0·31	2·7 ...	15·0 ...	8·3 ...	28·2 0·36	8·5 ...
12·1 ...	10·8 ...	3·3 ...	6·3 ...	1·5 ...	19·5 ...	11·3 ...	5·0 ...	5·4 ...	7·4 ...	5·4 ...	4·7 ...	2·0 ...
8·1 0·31	11·6 ...	3·9 ...	3·7 0·00	4·7 ...	... ...	0·4 ...	5·0 ...	19·5 ...	... ...	3·9 ...	... ...	0·4 ...
3·4 ...	7·2 0·80	4·9 0·33	5·4 0·29	10·4 ...	4·1 ...	2·6 ...	1·6 ...	5·1 0·24	5·7 0·24	6·4 ...	4·3 0·18	7·7 0·4
2·8 ...	4·4 ...	4·9 ...	8·5 0·00	8·8 ...	2·3 ...	20·0 ...	18·8 ...	1·2 ...	7·1 ...	0·5 ...	5·6 0·18	7·3 ...
70·3 ...	40·0 ...	58·5 ...	36·8 0·00	26·5 ...	28·0 ...	43·1 ...	25·4 ...	37·1 ...	11·4 ...	14·7 ...	33·8 ...	13·7 ...
63·8 0·31	62·4 0·40	44·4 0·33	57·0 0·63	43·8 0·24	70·6 0·26	77·5 0·76	49·9 0·94	61·0 ...	25·7 ...	39·1 ...	37·0 0·36	25·8 ...
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...
8·4 ...	... ...	... ...	0·2 ...	0·5 ...	0·3 ...	... ...	... ...	... ...	... ...	... ...	0·9 ...	... ...
13·4 ...	6·8 ...	7·2 ...	6·2 ...	6·9 ...	18·0 ...	8·0 ...	1·6 ...	2·2 ...	6·0 ...	1·5 ...	1·6 ...	6·0 ...
1·9 ...	1·6 ...	1·6 ...	1·9 0·06	2·8 0·24	2·8 ...	0·8 ...	0·6 ...	1·7 ...	1·9 ...	2·4 ...	1·8 ...	2·4 ...

36. Followers.

Admission rates for followers at 323·2 per 1,000 show an increase of 51·2 over 1938. The death rate has been 2·50 and invaliding rate 4·23 per 1,000.

The following table shows the sickness rates for followers during the past 5 years. Sick rates for followers are usually on a much lower level than for troops partly because they are less likely to report sick as long as they can carry on with their work.

TABLE 59.

Sick rates for Followers

	Ratio per 1,000.
1935	302·9
1936	279·1
1937	279·0
1938	272·0
1939	323·2

The principal diseases are similar to those for I. O. Rs. as below :—

Diseases of Followers

	Rate per 1,000.
Malaria	98·4
Venereal diseases	10·2
Dysentery	9·1
Pneumonia	8·1
Sandfly fever	5·1
Pulmonary tuberculosis	1·7

In all Commands there have been similar increases in the sick rates of these personnel. In Northern Command there has been an increase of 21 per 1,000 to 312 per 1,000, a good average figure. The principal causes of sickness have been malaria which has risen due to increases in Kohat and Waziristan Districts ; pneumonia which is slightly higher than last year but in 124 cases there were only 9 deaths ; the dysentery-diarrhœa group which has decreased slightly ; sandfly fever with a marked decrease to the lowest recorded figure of 5·88 per 1,000 ; cholera one suspected case and 35 cases of mumps.

In Southern Command too there has been a marked rise of 126 per 1,000. Two factors are concerned firstly that followers are not provided with mosquito nets and malarial admissions jumped 284 to the high figure of 659 actual cases, secondly in peace time there is too much leniency towards elderly, debilitated followers who are allowed to serve on although unfit for field service and who on the outbreak of war justifiably went sick. There were increases also in dysentery, venereal and pneumonia.

Western Independent District also showed an increase, 50 per 1,000, with malaria and sandfly fever as the chief causes.

In Quetta the Labour Reconstruction Camp Hospital closed in August as an economy and the Indian Military Hospital took on its work. There was an increase in sandfly fever and malaria, but a decrease in dysentery in this community. Daily local inspections and treatment were continued as described for 1938.

37. Principal interesting features of the Year.

(*See* paragraph 5.)

(*a*) The declaration of War and the preparation and despatch of overseas troops and replacement of units was the outstanding feature of the year. Subsequently there was much movement of troops ; Territorial Forces were embodied ; protective posts over widely scattered and often unhealthy areas were manned ; Reservists and returning leave men arrived in large numbers from malarial infected areas and Recruiting Centres were flooded with eager applicants.

(*b*) Tetanus Toxoid immunisation was carried out for Indian Troops of overseas forces and has been arranged now for the whole Army in India.

(*c*) Operations were carried out in the Shaktu Valley in Waziristan, at Cuttack in Orissa in the east and at Sukkur in Sind in the west. The health of troops remained remarkably good.

(*d*) Hospitals had to be expanded in certain stations to meet requirements of increased garrisons.

(*e*) Drought conditions prevailed in Rajputana and the Eastern Punjab. The garrison of Nasirabad had to be reduced because of water shortage.

(*f*) In P. & A. and Meerut Districts there were increased sick rates in all the six principal diseases : Malaria, sandfly fever, dysentery, venereal disease, influenza and minor septic diseases but in contrast Rawalpindi district showed decreases in malaria, minor septic diseases, sandfly fever, scabies and venereal diseases.

38. Factors which have affected the incidence of disease amongst troops.

(*a*) The changed distributions of troops due to the War ; the manning of defensive posts in out-of-the-way and often unhealthy areas ; the frequent moves ; the crowding of barracks and quarters with recalled leave men, with reservists and with recruits many of whom must have been heavily infected with malaria and other communicable diseases were important factors.

(*b*) There was a prevalence of cholera in the East and Central India ; plague in the South ; small-pox round Abbottabad, Lahore, Ambala and Meerut ; Malaria in the U. P. and the Bombay area.

(*c*) An excess rainfall in the Agra-Lucknow area on the 6th September, 11·26 inches in one day, which caused much destruction in the former, produced an epidemic of sandfly fever.

(*d*) Anti-insecticide spraying has been considerably developed and arrangements were made for manufacture of the pyrethrum spraying solutions from Kenya grown flowers prepared in the Military Medical Store Depots.

(*e*) Active operations in the Shaktu Valley in February and March with cold, rain and snow ; ' Civil disturbance ' forces in Orissa at Cuttack and at Sukkur in Sind. In all the health of the troops remained remarkably good.

(*f*) *Estforce.*—A small force, some British but mainly Indian troops, had to be sent to Orissa early in January 1939. This force assembled at Cuttack and was finally withdrawn early in August being gradually reduced after june.

Orissa has a hot moist climate with high humidity, the villages are poor and a great deal of squalor exists. Flies and insects abound and fly-borne diseases are common. The following diseases are endemic : Malaria, Dysentery Small-pox, Cholera, Filariasis, Hookworm and Anthrax.

Measures for the preservation of the health of the troops had to be extensive and these would appear to have been well carried out because the incidence of sickness under these adverse conditions was satisfactory.

During the period the following were the principal admissions for Indian Troops :—

Malaria	14
Dysentery	3
Scabies	16
Local injuries	17
Septics	4
Enteric group	1
Syphilis	1
Pharyngitis	1
Jaundice	3
T. B. Lungs	2
All others	17
TOTAL	79

Barrack Treatment.—An average of about 100 each month. 2 deaths occurred.

As these troops were moving about in mechanized transport it was reported that severe discomfort from dust was experienced causing inflammed eyes and a feeling of cold in the head. Goggles had eventually to be issued.

PRINCIPAL DISEASES AFFECTING INDIAN ARMY TROOPS.

39. Malaria.

Amongst Indian troops the admission rate has been 118·3 per 1,000 compared with 109·7 of 1938.

From nearly 14,000 cases there were fewer deaths than the 6 of the previous year.

The reduction in this disease over the past 10 years is well shown in the table and graphs below.

TABLE 60.

Annual admission for malaria—Indian troops.

Over 10 years.

Year.	Ratio per 1,000. Admissions.	Invaliding.	Deaths.
1929	175·3	0·22	0·15
1930	153·4	0·06	0·13
1931	149·4	0·08	0·10
1932	145·1	0·07	0·10
1933	212·2	0·05	0·06
1934	156·5	0·06	0·05
1935	125·9	0·03	0·08
1936	123·1	..	0·07
1937	97·9	..	0·04
1938	109·5	0·04	0·05
1939	118·3	0·02	0·04

The monthly incidence during the year is shown in Chart III.

The incidence of the various types of malaria by Commands is shown below.

TABLE 61.

Admissions and deaths for malaria by Commands.

Ratio per 1,000.

Commands.		Admissions and Deaths. B. T.	M. T.	Quartan.	Clinical.
Northern Command	A.	89·3	29·0	0·2	4·4
	D.	..	0·03	..	0·02
Western (I.) District	A.	94·7	18·9	0·09	6·0
	D.	..	..	..	..
Eastern Command	A.	58·3	36·5	0·4	6·2
	D.	..	0·04	..	..
Southern Command	A.	71·8	39·3	0·2	2·9
	D.	..	0·05	..	..
All India	A.	79·9	31·5	0·2	4·7
	D.	..	0·03	..	0·01

The principal stations in which the admission rates were over 100 per 1,000 are shown in the following table which gives large stations and small stations.

TABLE 62.

Large stations.		Small stations.	
Mir Ali	290·8	Baroda	237·5
Fort Sandeman	199·3	Thal	225·3
Razmak	190·9	Mhow	188·8
Jubbulpore	180·7	Almora	188·4
Poona	178·2	Ahmedabad	179·8
Dehra Dun	177·7	Lansdowne	163·2
Meerut	174·0	Dharamsala	162·0
Bannu	159·7	Bakloh	138·3
Ambala	155·6	Malakand	100·7
Lahore	144·9	Shillong	103·2
Jhelum	127·4		
Abbottabad	122·5		
Landikotal	123·2		
Quetta	118·8		
Kohat	107·1		
Rawalpindi	103·6		

Increases are shown by all Commands except Northern. This increase however was not great except in parts of Southern Command and in most instances did not exceed the rates of the normal years.

In Western Independent District there was an increase of 24 per 1,000 but the rate is 59 per 1,000 less than any preceding year except that of the exceptional 1938. Civilian figures on the other hand show an increase of 30 per cent. The incidence was late into the autumn, *viz.*, to the end of November in Chaman, due to high humidity and temperature and to returning leave parties. Karachi showed a remarkable fall in figures; the distinction made here between "Fresh" and "Relapse" cases as given is illuminating.

Karachi

	Fresh.	Relapse.
B. T. cases	5	23
M. T. cases	4	8
Clinical	3	21
Total	12	52

or a relapse rate of 81 per cent.

One can only comment from these results that either the figures are entirely fallacious or the methods of treatment are extremely inefficient.

It was owing to the obvious inaccuracies in distinction between " Fresh " and " Relapse " cases amongst Indian troops from very many stations that it was decided to abandon this distinction for Indian troops. The distinction was inaccurate, grossly misleading and used as a cloak of self complacency by officers who showed that all cases in their station were " Relapse " cases from elsewhere and that there was no malarial infection present in their's. From the end of 1939 malaria for Indian troops will be recorded as " total " malaria.

In Eastern Command there was an increase of 373 actual fresh infections. It was estimated that 60 per cent of all Indian troops' malaria was acquired out of cantonments. A definite decrease in Jhansi was surprising at first sight, but was accounted for by troop movements. Meerut and Dehra Dun were particularly affected by imported malaria and infections on outpost duties on Bridges.

In Southern Command the increase was due to malaria in Bombay, Saugor and Jubbulpore ; in all there was quite an epidemic of infections. In Bombay there were 10 cases of Quartan fever. The majority of cases were from small defensive posts scattered in unhealthy areas in the autumn. Difficulties were experienced in net-suspension because in barracks net-wires are provided and poles were not available or were not used. It is essential that proper means of suspension for mosquito nets should be provided wherever space permits. Steps are being taken to secure this provision for the future.

In Northern Command Malaria continues to produce double the admissions of any other disease, but in this year it has actually decreased 9 per 1,000 and gave the best year for 11 years. There is however no marked tendency to progressive fall as for the British over the past 15 years, this being due to recruits arriving infected, chronic cases with tolerance living in the lines, bazaar life and infection while on leave. For all such cases the use of the full therapeutic course is decidedly the most effective method for stopping admissions and draining the reservoir. Spraying campaigns are said to have produced most satisfactory results at Sialkot, Dharamsala, Bakloh, Jhelum, Rawalpindi, Nowshera and Peshawar.

At Jhelum special attention was paid to freeing from infection families living in the lines. The very low incidence of malaria amongst the men is attributed to this.

In Waziristan District there are two remarkable contrasts. Mir Ali with an admission rate of 230 per 1,000 due to cases at the groups of piquet-in the Shinki defile which are surrounded by areas over which anti-malarial control cannot be maintained and Wana at which the admission rate is 83 per 1,000 and is lower even than the remarkable result of 1938. At Wana and Damdil an extensive trial of prophylactic Atebrin was undertaken during the autumn—*see* para. 64-B.

The progressive fall in Peshawar District is also worth noting.

137·82 163·34 94·98 97·14 78·07

In this district mosquito proofing is provided at Chakdara but the proofed rooms are too hot to use.

In all reports it is noted that the best results are invariably obtained and the greatest freedom from malaria achieved in those places and in those units in which the greatest attention is paid to the details of prevention. Wherever there is personal interest by the commanding officer and by company and platoon commanders in the supervision of nets, use of cream, in regular and painstaking spraying and in lectures and talks, there the malarial incidence is relatively least. Where such interest is lacking preventive measures are neglected. For example an A. T. Company returned from the Frontier heavily infected and was housed in a large station next to another A. T. Company. When a flood of infections were noted in the latter it was discovered that nets were not being properly used by either company and no active anti-malarial measures were being carried out.

In Western Independent District the localisation of malarial cases is interesting.

Quetta.	Travel.	Camp 47 miles away.	Camp Khauozai 46 miles away.
41	1	23	15

40. Sandfly Fever.

With the admissions for this disease now at over 700 for the whole of India there has been a break in the recent downward trend. The all-India annual incidence is shown in the following table :—

TABLE 63.

Sandfly Fever.

	Ratio per 1,000.
1934	8·3
1935	7·5
1936	10·6
1937	6·0
1938	4·6
1939	6·0

The incidence in the principal districts affected by this disease has been as follows :—

TABLE 64.

Comparative Table of Sandfly fever in Districts.

	Ratio per 1,000. 1938.	1939.
Rawalpindi District	7·6	3·6
Peshawar District	14·2	13·1
Kohat District	1·8	12·9
Western (I) District	5·7	13·7
Delhi (I) Bde. Area.	5·4	1·7
Lucknow District	3·3	12·8

It is observed that the reduction has been in the Northern Command, particularly in Rawalpindi District, and the Command figures over 10 years are again worth quoting.

TABLE 65.

Sandfly fever in Northern Command.

1929	36·04	per 1,000.
1930	21·54	
1931	27·46	
1932	27·56	Spraying and fumigation as an anti-malarial measure in certain stations.
1933	16·53	
1934	14·85	
1935	18·83	
1936	18·43	Spraying campaign intensified as an anti-sandfly and anti-mosquito measure.
1937	10·65	
1938	7·10	
1939	7·80	

The figures for Landikotal, that hot bed of sandfly fever, are perhaps even more remarkable.

TABLE 66.

Sandfly fever in Landikotal.

1934	224 cases.
1935	239 „
1936	97 „
1937	27 „
1938	19 „
1939	23 „

Peshawar District shows a progressive fall to the present 13·13 per 1,000. Rawalpindi District now has the very low rate of 3·65 per 1,000 attributed to spraying campaigns. On the other hand Damdil, a typical perimeter camp at medium altitude with mud walled huts and perimeter wall, produced a mass of cases. One Gurkha battalion had 120 cases during the summer whereas the next door battalion had practically none.

At Mir Ali there were 109 cases of fever all of the Sellar type, as also at Wana, but as Sellar fever does not appear in the nomenclature of diseases these have been diagnosed sandfly fever.

In Western Independent District, Indian troops in contrast to British have given an increase of 94 cases. This incidence is due to heavy infection at Quetta, Loralai and Fort Sandeman whereas there was a decrease at Karachi.

Eastern Command figured prominently this year with many cases from Lucknow and from Agra. The Lucknow cases occurred in June when the disease was prevalent amongst all troops and in the autumn when there was an influx of recruits and reservists and it was noted that Indian troops suffered more than usual.

At Agra torrential rains in September did much damage in the city and villages and this was followed by an epidemic of sandfly fever.

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41. Dengue.

The all-India incidence has remained at 1·1 per 1,000.

TABLE 67.

Dengue.

1934	2·5 per 1,000
1935	3·4
1936	2·6
1937	5·0
1938	1·1
1939	1·1

The stations chiefly affected were in Eastern and Southern Commands.

	1938.	1939.	
Dacca	..	21·4	per 1,000.
Alipore	..	39·6	
Bangalore	19·2	29·5	

P. & A. District and Madras District were the areas affected this year. In the former, of 47 cases 34 cases occurred at Alipore at the time when there were 268 cases amongst British troops for the disease. In Southern Command there were no cases either in Bombay or at St. Thomas Mount, Madras ; a fact remarkable enough to deserve mention. Of 81 cases in Madras District 78 were from Bangalore. Here mosquitoes of all kinds were prevalent and Dengue increased a pace. Indian troops had 78 cases compared to 25 of the previous year and British 8 compared with 3 of 1938.

42. Fevers of the Typhus Group.

There were 42 cases amongst Indian troops compared with 38, 43, 48, 45 and 51 of the previous years. The details have been considered in paragraph 10 of Section I.

43. Enteric Group of fevers.

The comparison of these diseases has been considered under paragraph 11, Section I. The decline in incidence has been maintained for Indian troops, the admissions rate being 0·5 this year.

TABLE 68.

Case incidence of Enteric Group fevers.

Ratio per 1,000.

1934	1·9
1935	1·4
1936	0·7
1937	0·9
1938	0·8
1939	0·5

This steady decrease in case incidence for Indian troops who must often quite definitely be subject to the possibilities of severe or mass infection is indeed most satisfactory, and is one of our outstanding successes in preventive medicine.

A perusal of the Preliminary Report of the Public Health Commissioner for 1939 shows how widespread and intense are Enteric Group infections in the civil population ; thus :—

> In the N.-W. F. Province, especially in the larger towns, enteric fever was prevalent and the death rate was nearly doubled in Peshawar : in Bengal there was a marked increase in urban and rural areas : in the C. P. there were 1,285 recorded deaths and the Commissioner reports that the incidence of this disease is considerably higher than recorded mortality figures would indicate : in Bombay the epidemic of 1938 continued in less severe form into 1939 : in Madras Presidency the disease was widespread and prevalent throughout the year and in Assam enteric continued in all parts of the province with a sharp epidemic in one area.

It is therefore obvious that we have a civilian population riddled with Enteric group infection and yet living in their midst is our military personnel composed of the same classes and types who only have one man in 2,000 even infected during the year.

The greater part of this success is unquestionably due to our standard of protective immunisation by T. A. B. inoculation. The percentage of all ranks protected is as follows :—

British officers	97·4
Indian other ranks	98·6
Followers	99.1

Inoculation in our army is a voluntary procedure, but even so we have nearly 100 per cent. who are fully protected. Those shown as unprotected are usually newly joined recruits, men on long leave or absent for some other cause when inoculations were being done, or, in the case of Officers, those who through sheer forgetfulness have failed to attend in time for inoculation.

As further evidence of success the following table shows the relative proportions of protected and unprotected who have actually been infected or died.

TABLE 69.

Comparison of incidence in Protected and Unprotected personnel.

Personnel.	Ratio per 1,000 of respective strength. Cases.	Deaths.	Case mortality per cent.
Protected by T. A. B.	0·4	0·04	10·42
Unprotected	9·1	1·13	12·50

It will be noted that out of rhe very large numbers of protected men at risk only 4 in 10,000 were infected and only 4 in 100,000 died, whereas of the small unprotected group nearly one in every ten went down with infection.

In the case mortality the advantage of T. A. B. protection is also shown by the above table.

44. Dysentery, Diarrhœa, Colitis and Amoebic Hepatitis.

A very different picture is shown by this preventable group of diseases. As with British troops, so with Indian the proximity of bazaar areas, suddar and municipal, plays a predominant part in these fly-borne infections. Indian troops frequent and buy foodstuffs in these bazaars, but have the counteracting factor of relative immunity compared with British personnel. Even the slight reduction on the figures of 1938 gives little cause for real satisfaction as an indication of any real improvement.

TABLE 70.

Dysentery, Diarrhœa, Colitis and Hepatitis.

Ratio per 1,000

	Dysentery.	Diarrhœa.	Colitis.	Total.	Hepatitis.
1933	15·3	7·9	0·3	23·5	0·6
1934	13·9	6·3	0·2	20·5	0·7
1935	12·2	5·6	0·2	17·9	0·5
1936	11·0	6·2	0·3	17·5	0·6
1937	12·4	5·4	0·4	18·3	0·5
1938	17·2	7·5	0·2	24·9	0·6
1939	17·1	6·3	0·1	23·5	0·5

The monthly incidence during the year is shown in Chart No. XI.

Admissions for different types of dysentery remain very much the same. They are given below.

	Percentage of cases.
Dysentery, protozoal	3·40
Dysentery, Bacillary, proved	66·12
Dysentery, Bacillary, exudate . . .	11·91
Dysentery, Clinical	18·57

The case mortality on the total of admissions was 0·25 per cent. The distribution by Commands is given in the table below.

TABLE 71.

Dysentery by Commands—Ratios per 1,000

Commands.	Amœbic.	Bacillary, proven.	Bacillary, Exudate.	Clinical.
Northern	0·4	10·5	2·2	2·7
Western	0·4	8·7	1·9	4·1
Eastern	1·2	12·9	1·5	3·6
Southern	0·5	12·9	2·3	3·5

In Commands this group presents a most distressing picture of continuance at the same level or even of increases.

Eastern Command has shown a steady increase for the past 5 years. Jhansi had the highest rate ; a fact justifiably attributable to the proximity of the Municipal trenching grounds and its mass of dysentery-carrying flies. The municipal trenching ground is now being moved. Southern Command shows no signs of decrease ; Bombay District had its highest rate for 6 years the cause being an increase of 19 per 1,000 at Mhow ; and fly-proofing of dining rooms is strongly advocated. Western Independent District shows a slight decrease to the normal figure ; in Hyderabad Sind 23 out of 37 cases came from the Territorial unit. Northern Command although showing a slight

decrease has no evidence of real reduction from a normal figure of 20 to 24 per 1,000.

In every area it is stressed that this is a fly-borne disease, occurring subsequent to any prevalence of flies and due to carriage of infection from insanitary, infected ground and latrines to unprotected feeding places and dining rooms. The monthly figures and the known facts of insanitary surroundings and numerous cases, acute and chronic, in surrounding populations clearly show the correlation between the carrying house fly and the infection of our troops.

Comments on and illustrations of this have been made from Bombay, Kohat, Peshawar, Rawalpindi, Quetta and Lucknow. Even from Egypt from Indian units stationed there comment has been received on a marked prevalence of dysentery and diarrhœa occurring in the autumn associated with a heavy prevalence of flies.

45. Cholera

In spite of the widespread and, in places, severe epidemic amongst the civilian population, see paragraph 6 (*c*), in the previous 10 years there have only been 1 or 2 cases in each year except for the small group of cases due to one isolated outbreak in Waziristan last year. In the present year there has been only one case, at Fatehgarh.

This marked immunity of Army personnel is unquestionably due to the protection afforded by good water supplies, hygienic control in cantonments, the careful watch which is kept over the occurrence of such infectious diseases and to the immediate application of the appropriate preventive and protective measures.

46. Diseases of the Digestive System

The admission rate was 56·6 per 1,000 for this group of diseases with 15 deaths and 32 invalids compared with 51·7 per 1,000 and 21 deaths in the previous year.

The most important diseases of this group and a comparison of some of these diseases over the past three years is given below.

TABLE 72.

Diseases of the Digestive System—Ratio per 1,000.

	Tonsillitis.	Pharyngitis.	Gastritis.	Dyspepsia.	Jaundice.
1937 . . .	5·8	16·1	1·0	4·1	1·9
1938 . . .	6·1	19·3	1·1	5·2	2·1
1939 . . .	5·5	24·1	1·2	4·5	2·8

There were over 300 cases of Jaundice this year the cases being of the catarrhal type with no obvious infective cause.

Taenia infections.—The number of admissions for infection by the Tape worms was 54 this year compared with 42 of last year. In the present year the main types were *T. saginata* 33 cases and *T. solium* 8 cases. The greatest number of cases of *T. solium* were admitted in Northern Command.

Ankylostomiasis.—There were over 700 admissions for this, the majority being in Northern Command at Jullundur, Bannu and Kohat.

Abbottabad.—In a series of Helminth examinations 378 stools of the general population were examined by the salt concentration method. 138 were found to contain ova of Helminths, 100 were Ankylostome. Of Recruits, 235 were examined (210 Gurkha recruits); every single stool contained ova of some kind either Ankylostome or Ascaris.

Of serving soldiers 11 out of 25 had ova.

Of menial hospital personnel, 215 menials, 88 had ova of Ascaris or Ankylostome or both.

Razmak.—During routine carrier examination from 955 examined 337 or 35·2 per cent. showed the presence of Ankylostome ova.

Mir Ali.—Ascaris Lumbricoides. One case passed 67 worms at one sitting. The sight was terrific.

Nowshera.—Guineaworm in men of the Mahratta Light Infantry who come from infected areas.

Ankylostomiasis mostly in recruits of the Sikhs Battalion.

47. Cysticercosis

There were no admissions during the year amongst Indian Troops or Followers.

48. Oriental sore

There were nearly 140 admissions for this condition, but a large number are treated as out-patients. This has been referred to in paragraph 16.

The incidence in four years has been :—

	British troops.	Indian troops.
1936	63	448
1937	37	165
1938	53	391
1939	19	205

A strenuous spraying campaign has been carried out during 1939 to endeavour to control this very considerable cause of inefficiency, while protection of sores from sandflies or other flies has been ensured by means of plaster covering.

The record is too short to give any conclusions as to the efficacy of the preventive measure. Exactly half the cases came from the Cavalry Regiment which has always been most affected.

The following remarks from Bannu are illuminating in considering the source of infection.

> "There were 10 cases of oriental sore of which 8 were from Animal Transport Companies."

TABLE 73.

Oriental sore : admissions over 10 years.

Ratios per 1,000

1930.	1931.	1932.	1933.	1934.	1935.	1936.	1937.	1938.	1939.
0·41	1·21	0·48	0·45	0·88	0·57	1·48	1·37	0·85	1·17

49. The Minor Septic and Local injuries Group of diseases.

This prolific combined group produced nearly 16,000 admissions in the year for British and Indian troops, and the man-days lost comes to nearly 220,000 days.

TABLE 74.

Annual comparison of Minor Septic and Local injury group.

Ratio per 1,000

Year.	Minor Septic diseases.	Local injuries.	Cellulitis.	Boils.
1936	33·4	52·6	24·5	6·0
1937	31·4	51·8	23·5	5·4
1938	34·1	59·8	25·5	5·9
1939	36·8	57·0	26·1	7·5

There is no indication of any decrease in the admissions for this group. Southern Command had 837 cases or an increase of 100 on the 1938 figure. Eastern Command showed a slight decrease but is still high at 107 per 1,000.

50. Venereal diseases

This group accounted for approximately 1,000 admissions compared with 837 of the previous year.

TABLE 75.

Comparison of groups of venereal diseases.

Ratio per 1,000

Diseases.	Admissions.				Percentage.	
	1936.	1937.	1938.	1939.	Increase.	Decrease.
Gonorrhœa . . .	4·8	3·4	2·9	3·4	0·05	..
Syphilis	3·4	3·0	3·1	3·4	0·03	..
Soft chancre . . .	1·6	1·7	1·5	1·2	..	0·03

Northern Command.—A steady progressive decrease is noted for which no reason is apparent.

Southern Command.—Marked increase chiefly in Gonorrhœa difficult to explain but in case of Motor Drivers was thought to be deliberate to avoid overseas service. A "Forward" policy of treatment is essential to avoid unjustified wastage from this cause.

Western Independent District.—A small improvement is shown but figures are average. All new Barracks in Quetta are being equipped with P. A. Rooms.

Bombay District.—Increase : highest figure for at least 6 years, all stations except Baroda.

Waziristan District.—Lowest figure for at least 11 years and at 4 per 1,000 per year is remarkable.

Peshawar District.—Steady fall over 6 years.

8·02 7.14 5·44 4·77 5·19 3·80

The tendency for the *admissions* for the total venereal diseases amongst Indian troops and followers to remain at a low level is well illustrated by the following.

TABLE 76

Annual comparison of total venereal
Ratio per 1,000

1929.	1930.	1931.	1932.	1933.	1934.	1935.	1936.	1937.	1938	1939.
12·9	11·1	10·9	10·6	10·8	9·6	10·1	9 8	8·2	7·5	8·5

51. Scabies

This disease has come into considerable prominence recently. The admission rate for the year has been 11·9 per 1,000.

TABLE 77

Scabies admissions during past 5 years—Ratio per 1,000

1935	9.6
1936	7·7
1937	7·7
1938	11·2
1939	11·9

The general rate has been affected by increases in all three Commands. In Eastern Command of 331 cases 210 were from Meerut District. In Southern there were 334 cases but the shortness of the treatment means that the average constantly sick figure is not markedly affected. In Northern there was a slight increase which brings the admission rate to the second highest recorded. A decrease in Rawalpindi district was due to a reduction of 16 per 1,000 at Jhelum, but there is still scope for improvement at 12 per 1,000.

It is a trivial disease but causes the loss of many man-days. It is usually imported by returning leave men from their homes and needs constant vigilence for detection at inspections. In Southern Command in one inspection no less than 16 early cases were detected.

52. Small-pox

The incidence is practically constant at 21 admissions this year and is remarkably small considering the population at risk. The vaccination state is very high ; 99·6 per cent. being fully protected at the half-yearly October census.

There were very definite epidemics amongst the civilian populations at Dera Ismail Khan in Waziristan and other Frontier stations, at Abbotabad where there were 5 military cases, at Ambala where there were 9 cases in Indian Other Ranks and their families and in the Central Provinces.

TABLE 78.

Annual comparison of smallpox—Actuals.

1934.	1935.	1936.	1937.	1938.	1939
23	22	20	16	22	21

Cases were extremely scattered ; Ambala (4), Calcutta (2), Meerut (2), Drosh (2) and 11 other stations only one case each.

53. Cerebro-spinal fever

There were 28 cases of which 15 occurred in Northern Command. The seasonal incidence and location are best shown by the table below.

TABLE 79.

Cerebro-spinal fever among I. Os. and I. O. Rs. (1939)—Actuals.

Stations.	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Landikotal	1	...	...	...	...	...	...	...	...	...	...	...	1
Mardan	...	1	3	...	...	...	...	...	...	...	...	...	4
Abbottabad	1	...	1	...	...	1	...	...	...	...	...	1	4
Jhelum	...	...	1	...	...	...	...	...	...	...	...	...	1
Rawalpindi	...	...	1	...	...	...	...	...	...	...	...	...	1
Ferozepore	...	...	...	...	...	...	...	...	...	1	...	1	2
Lahore	...	...	...	...	1	...	...	...	...	...	...	...	1
Razmak	...	...	...	...	...	...	...	...	...	...	...	1	1
Jhansi	...	...	...	...	...	1	...	1	...	...	...	...	2
Roorkee	...	...	...	...	...	...	...	...	...	1	...	...	1
Gorakhpur	...	...	...	...	...	...	...	...	...	...	...	1	1
Lucknow	...	...	...	1	...	...	...	...	...	...	...	...	1
Shillong	...	...	...	...	...	...	...	1	...	...	1	...	2
Dacca	...	...	...	...	...	...	...	...	...	1	...	...	1
Agra	...	...	...	...	...	...	...	...	...	1	...	...	1
Poona	...	...	...	...	...	...	...	...	...	...	1	...	1
Nasirabad	...	...	...	...	...	...	...	...	...	...	...	2	2

Careful records were kept of humidity and temperature in several places but no evidence was produced that periods of high humidity were particularly favourable to the development of the disease. But conditions vary so in India that only very exact records could be reliable on this point. In one or two other stations Rawalpindi and Jhansi it was specially noted that cases occurred when the humidity had risen.

There were 4 cases in Jhansi in the Cavalry Regiment where there was overcrowding at times in barracks and the humidity had risen.

The two cases in Cavalry Recruits were severe but recovered with M. and B. 693 and also two contacts with symptoms of headache and pain in the neck cleared up with prophylactic M. and B. 693.

TABLE 80.

Annual comparison of Cerebro-spinal fever.

1934.	1935.	1936.	1937.	1938.	1939.
39	19	16	17	23	28

54. Poliomyelitis

There were three cases from Indian troops, Barian, Quetta and Poona.

55. Diseases of the Respiratory system

The diseases of this group including pulmonary tuberculosis and pneumonia gave an incidence of 24·0 per 1,000. There were definite mild epidemics; one at Nasirabad in December, 117 cases in Deccan District, 51 cases in Bombay District and a general increase in Eastern Command. Deaths from this group were :—

Pneumonia 34 or a case mortality of 5·39 per cent.

Tuberculosis 7 or a case mortality of 3·21 per cent.

Bronchitis 1 or a case mortality of 0·06 per cent.

Other respiratory diseases 3 or a case mortality of 0·72 per cent.

Pulmonary Tuberculosis, of which there were nearly 220 cases during the year has shown a rise of 30 cases and the highest ratio per 1,000 for 9 years. 222 I. Os.,.I. O. Rs., and Followers were invalided.

The admission and invaliding rates for Indian Officers and Indian Other Ranks and for Followers for the past 5 years has been as follows :—

	Indian officers and other ranks.		Followers.
	Admissions.	Invalids.	Admissions.
1935	1·9	1·66	1·6
1936	1·7	1·66	1·7
1937	1·6	1·46	1·6
1938	1·7	1·43	1·8
1939	1·9	1·70	1·7

There was a puzzling outbreak of 12 cases at Khajuri Kach and Mir Ali. Ten served in Khajuri for several months occupying one of the permanent picquets ; 6 were from the Support Platoon, 4 in other platoons and 2 not closely connected. The Support Platoon occupied the 2nd storey of No. 5 Shinki Piquet. Sanitary conditions were satisfactory but ventilation was restricted and there was some overcrowding.

Probably one of the early cases was an open virulent case and contributed to the spread to all others. The cases of one or two were in dispute as to disability pensions.

The prevalence of Tuberculosis in India.

The opinion of many experienced observers is that tuberculosis in India is on the increase.

In this connection it may be of interest and possibly of value to examine the trend of tuberculosis in Indian military and potential military personnel. The following table shows the incidence of total tuberculosis in the Army in India during the past 20 years.

TABLE 81.

Total Tuberculosis in the Army in India.

All Ranks—Ratio per 1,000

Year.	British Army.	Indian Army.
1919	2·2	4·3
1920	1·6	4·7
1921	1·2	3·9
1922	1·0	3·8
1923	1·1	3·2
1924	1·2	3·2
1925	1·0	3·1
1926	0·8	2·4
1927	1·1	2·7
1928	0·7	3·3
1929	1·7	3·8
1930	1·2	3·5
1931	1·0	3·3
1932	1·3	2·4
1933	1·0	2·1
1934	1·1	2·1
1935	1·3	2·4
1936	1·3	2·0
1937	1·4	2·0
1938	1·2	
1939	1·3	

These figure include pulmonary and non-pulmonary tuberculosis amongst Officers and all ranks and followers.

It will be observed that during the past 8 years the numbers for the Indian Army have tended to remain stable with an inclination to decrease.

As a slight guide to the tendency in the civil population the tuberculosis noted at recruiting centres amongst the recruitable population may be of future use.

TABLE 82.

Numbers of rejections at Recruiting Centres for Indian Army—Actuals.

1929	103	
1930	75	
1931	76	
1932	51	
1933	80	
1934	82	
1935	192	The factors concerned
1936	187	are however very
1937	179	variable.
1938	64	
1939	90	

Pneumonia and Broncho-pneumonia.—The admissions rate for these remains practically constant. The total admissions were over 600 with 34 deaths, Northern Command producing the highest number while in Southern Command the admission rates are half those of 12 years ago.

TABLE 83.

Annual comparison of Pneumonia.—Ratio per 1,000

	1935.	1936.	1937.	1938.	1939.
Admissions	4·9	5·4	5·2	5·0	5·4
Deaths	0·51	0·61	0·34	0·43	0·29
Percentage mortality	10·42	11·38	6·61	8·56	5·39

Although there is an increase in cases, there is a further decrease in deaths which are now at a lower rate than in any recorded year, an aspect which is definitely gratifying. The Sulphonamide group of drugs has still further improved the position in the treatment of this disease so dreaded by Indian Troops and followers.

The incidence of the diseases of the group is best shown in table form.

TABLE 84.

Year.	Lobar pneumonia.	Lobular pneumonia.	Pleurisy.	Bronchitis.	Pulmonary tuberculosis.	Diphtheria.	Influenza.	Total all respiratory Diseases.
1934	5·0	1·0	1·8	14·3	1·8	0·1	10·5	34·5
1935	4·0	0·9	1·9	11·3	1·9	0·0	5·4	25·4
1936	4 4	0·9	1·9	11·3	1·7	0·1	7·3	27·6
1937	4·2	1·0	1·8	12·6	1·6	0·0	5·7	26·9
1938	4·0	1·0	2·3	12·4	1·6	0·1	4·4	25·8
1939	4·5	0·9	1·7	13·2	1·9	0·0	3·7	25·9

56. Effects of

There were 20 admissions which is the highest total for a number of years. The admission rates for troops for 6 years are shown.

TABLE 85.

Admissions for effects of heat—Ratio per 1,000

1934.	1935.	1936.	1937.	1938.	1939.
0·2	0·1	0·1	0·3	0·2	0·2

The majority of cases were admitted at Nowshera (11), Peshawar (3), Rawalpindi (2). The use of extra salt and its possible effects have been discussed in paragraph 26.

Comment is made from Waziristan that it is considered essential that Indian troops in Armoured Fighting Vehicles should have as heretofore ice for cooling the vehicle. There have so far been no untoward results due to the cessation of the issue.

57. Mental Diseases.

The number of admissions for this continues at approximately the same figure. The majority of cases were admitted in Northern Command with 19 cases.

TABLE 86.

Admissions for Mental diseases—Ratio per 1,000

1934.	1935.	1936.	1937.	1938.	1939.
1·0	0·8	0·9	1·0	0·9	1·3

58. Other Diseases

Mumps was much in evidence in Waziristan district, 277 cases at Bannu and Mir Ali in a Gurkha Battalion which had to be withdrawn from the Shaktu operations.

Kala Azar.—With over 50 cases of this infection the disease has assumed a considerable importance. The main feature of course is the difficulty of diagnosis and the very prolonged hospitalisation which is likely to occur unless treatment is energetically applied at an early stage.

So relatively common is the condition in some areas that all medical officers in charge of Indian troops should always bear in mind the possibility of an indefinite obscure case being one of *Kala Azar*. The incidence during the past 5 years has been as follows :—

Ratio per 1,000

	1935.	1936.	1937.	1938.	1939.
Indian other ranks . .	0·16	0·29	0·14	0·29	0·48

Poisoning.—77 men of a Mountain Battery at Landikotal were admitted with symptoms of acute food or chemical poisoning. With extremely energetic treatment all recovered within 48 hours. Laboratory reports were negative for bacterial infection but it was found that *arsenious oxide* was present in the Halwa to the extent of 9·8 grs. per lb. or 0·14 per cent. Such a dose may be fatal. No conclusion was reached as to the originator of this attempt.

A case of snake bite is reported from Roorkee occurring in a Havildar of recruits part of whose duty was to teach recruits what to do in case of snake bite. In stead of following his own advice to go to the hospital at once

tried quack treatment in the bazaar until he collapsed and was brought to hospital. Comment is made on the depressing fact that little real knowledge appears to penetrate into people's minds.

59. Recruiting.

The percentage of recruits accepted at the recruiting centres in the year ending the 31st March 1940 was 54·6 compared with 56·5 per cent. of the previous year, rejections being 45·4 per cent.

The principal causes of rejection of recruits for this year has been as follows.

TABLE 87.

Causes of rejection of recruits—Percentages. Over 40,000 recruits were examined at Recruiting Centres.

Disability.	Percentage rejected at Recruiting Centres.	Percentage rejected during training at Depots.
1	2	3
Malaria (enlarged spleen)	2·4	0·01
Tuberculosis (pulmonary)	0·1	0·10
Tuberculosis (other organs)	0·1	0·10
Venereal diseases	1·2	0·02
Other diseases due to infection	0·1	0·02
Diseases of the nervous system	0·1	0·10
Defective vision	5·0	0·02
Trachoma	5·6	0·02
Other eye affections	0·7	0·04
Otitis media	3·0	0·04
Defective hearing	0·1	0·02
Other ear diseases	0·6	0·01
Diseases of throat and nose	0·3	..
V. D. H.	2·2	0·01
D. A. H.	4·8	0·01
Varicose veins	1·9	0·01
Haemorrhoids	0·5	..
Varicocele	0·6	0·01
Other diseases of circulatory system	0·1	0·01
Anaemia	0·5	..
Goitre	1·3	..
Respiratory diseases (excluding tuberculosis)	0·5	0·03
Pyorrhoea	1·1	0·01
Loss or decay of teeth	0·1	..
Hernia	0·7	0·01
Other diseases of digestive system	0·1	0·01
Ankylosis of joints	0·6	..
Flat feet	1·3	0·01
Knock knee	1·0	..
Curvature of spine	0·3	..
Other deformities	1·6	0·02
Skin diseases	1·1	0·03
Poor physique	0·5	..
Other causes	5·2	0·50
Total	45·4	1·00

N.B.—The figures in columns 2 and 3, are in respect of the following only :—

Cavalry.
Artillery.
Sappers and Miners.
Indian Signal Units.
Infantry.

In the Report for 1938 the number of recruits rejected for Trachoma received some comment in view of the attention drawn to this by the District Soldiers' Board in the Delhi Recruiting Area. The numbers rejected for Trachoma at the main recruiting centres during 1939 were as follows compared to the two previous years.

TABLE 88

Stations.	Quarter ending 1937					1938					1939				
	Mar.	June.	Sept.	Dec.	Total.	Mar.	June.	Sept.	Dec.	Total.	Mar.	June.	Sept.	Dec.	Total.
Peshawar	12	5	4	10	31	4	7	8	14	33	3	3	7	76	86
Rawalpindi	59	45	36	8	148	8	20	27	16	71	22	36	28	148	234
Lahore	4	6	8	23	41	32	21	...	5	58	7	7	17	196	227
Jullundur	123	120	59	78	380	90	77	71	40	278	77	78	115	244	514
Delhi	185	150	334	196	865	149	199	176	128	652	117	165	80	144	506
Lucknow	1	3	7	6	17	8	4	6	2	20	7	10	29	17	63
Ajmer	1	...	...	1	2	...	1	...	...	1	...	1	...	...	1
Poona	1	...	4	...	5	1	2	...	2	5	...	...	1	2	3

It was observed on comparing 1936 and 1937 that the number rejected in 1936 in the Delhi recruiting area was just over 9 times that of 1937. In 1938 the number was less, but still more than 7 times the figure of 1936. It will be noted from the figures for 1939-40 that rejections at Delhi show a further decrease, actual and relative in the two halves of the year. There is a very marked jump in numbers rejected for this condition during the last quarter of the year at Rawalpindi, Lahore and Jullundur ; possibly due to previous rejects trying again.

MILITARY COLLEGES AND SCHOOLS.

Royal Indian Military College, Dehra Dun.

The health of the cadets has been very good with no serious illness. Mumps was introduced at the beginning of the autumn term but the infection faded out. Coryza, malaria, a few cases of dysentery and a chronic cystitis suspected of being tubercular comprised the medical cases and knee injuries, fractures and 3 cases of otitis media formed the surgical cases. A multiple fracture of the epicondyle of the humerus was the only unsuccessful surgical case.

King George's Royal Indian Military Schools.

Ajmer.—A healthy year with a decrease in sick rates from 282 to 159·2 per 1,000. The principal diseases were tonsillitis, local injuries and diseases of bones and joints. There were two cases of typhoid fever although inoculation and vaccinations are kept well up-to-date.

The increase in weight has been normal. Two boys were invalided for knock-knee.

Jhelum.—General health excellent with an average weight increase of 1½ lb. per month. There were 10 mild cases of trachoma, and other diseases were mild and normal. One unfortunate boy was invalided with Sarcoma of the leg.

Jullundur.—General health has been good and the average weight increase has been nearly 2½ lbs. per month. Diseases have been normal with trachoma in some evidence.

The Ghi issue was reduced to that required for cooking only. The saving thus obtained was expended in providing a daily packet of one ounce of fresh butter from the Government Military dairy to every boy.

At first received with doubt this issue subsequently became very popular.

60. Invaliding

There has been a definite rise in the invaliding rate during the year. This might well be expected in a year affected by the onset of war, but the amount of the rise from a very steady rate of many previous years indicates that in the case of reservists and many employed men medical examination for fitness or unfitness in peace time may be too lax or lenient. At the outbreak of war with prospects of service overseas it became obvious that many an elderly reservist or follower was not fit for general service. This is a point to which strict attention is desirable in the future.

Invaliding

Ratio per 1,000

1935	5·54
1936	5·52
1937	5·49
1938	5·83
1939	6·43

The principal causes of invaliding are shown in paragraph 35, Table 4 of Section II.

Special Cases.—From Waziristan District two cases were invalided for D. A. H. with extra systole. This may relate to the strenuous hill work which troops have to do in this area.

Invaliding by Commands.—The invaliding rates from Commands has been as follows during 1939 :—

	Ratio per 1,000.
Northern Command	5·89
Eastern Command	6·97
Southern Command	8·75
Western Independent District	3·88

61. Deaths

Death rates have fallen slightly and although not down to the level of the year 1937 is only just above the rate for this quinquennium.

Deaths

Ratio per 1,000

1935	2·15
1936	2·16
1937	1·77
1938	2·21
1939	2·12

Deaths in Commands.—The ratio per 1,000 have been as follows during 1939 :—

Northern Command	2·29
Eastern Command	2·01
Southern Command	1·99
Western Independent District	1·67

The principal causes of death and comment thereon are given in paragraph 35 and Table 56.

62. Officers

Special diseases and remarks

The admission rates for Officers has increased by 75 per 1,000 to 462·1 a figure which is in excess of any for the past 10 years but is not as great as the average for the quinquennium 1925-29.

Digestive diseases, injuries and malaria as in previous years form the three principal causes of sickness, the first shows an increase of 27 per 1,000 but malaria has slightly decreased.

Invaliding at 12·36 per 1,000 has returned to a more normal figure compatible with the past 10 years and deaths at 3·84 show the lowest figure for many years. (*See* paragraph 33, Tables 53-A and B and paragraph 34.)

In Northern Command there is an increase in admission rates, the rate is about normal, but deaths have satisfactorily decreased for British and Indian officers. In the latter there were none, and in the former 2 out of 3 were due to gunshot-wounds. In Rawalpindi District 187 per 1,000 of the 710·38 per 1,000 were due to digestive diseases and minor septic groups. Peshawar District showed a marked reduction in malaria and sandfly fever. In Waziristan at Bannu there was one case of enteric fever, the classical case of an officer who did not wish to be inoculated and acquired the infection on a train journey.

In Southern Command the disease rates were higher than in the previous year, but there were no deaths from disease. Two of the notified deaths were from mawling by tigers.

63. Followers

The admission rate at 323·2 per 1,000 is considerably more than that of 1938 and higher than any year for 10 years, except that for the unhealthy year of 1933.

The principal diseases of Followers with their annual variations are shown below.

TABLE 89.

Admission for followers.—Ratios per 1,000

Year.	Total admissions.	Malaria.	Sandfly fever.	Venereal diseases.	Pneumonia.	Dysentery-diarrhoea group.	Tuberculosis, Pulmonary.
1929	302·6	128·1	11·5	12·4	12·7	12·3	2·4
1930	250·6	86·3	6·4	11·3	11·9	14·5	2·6
1931	285·8	94·2	9·4	10·9	12·2	12·9	2·3
1932	266·4	90·7	7·4	10·3	9·9	11·3	2·2
1933	332·9	143·1	6·2	11·1	8·7	13·0	1·6
1934	287·6	102·5	4·4	10·5	10·3	12·6	1·9
1935	302·9	106·6	4·2	10·3	7·6	11·6	1·6
1936	279·1	84·1	8·6	9·8	7·8	9·2	1·7
1937	279·0	77·1	7·8	10·6	7·8	10·8	1·6
1938	272·0	74·9	4·3	9·6	7·2	12·5	1·8
1939	323·2	98·4	5·1	10·2	8·1	9·1	1·7

Malaria accounts for a large part of the general increase but the other diseases remain remarkably constant in their effect on this class of personnel.

Pneumonia as usual remains the principal cause of deaths but there has been a satisfactory reduction in the deaths rate from this cause which is halved compared to that of 1938.

TABLE 90.

Principal diseases and causes of death—Ratio per 1,000

Pneumonia	0·63
Infectious Diseases	0·42
Circulatory diseases	0·38
Digestive diseases	0·17
Injuries	0·13
Pulmonary tuberculosis	0·17
Other respiratory diseases	0·17

The death rate is less this year, *viz.*, 2·50 per 1,000 compared with 3·62, 3·96 and 3·58 per 1,000 for 1938, 1937 and 1936. This is still somewhat higher than the death rate for Other Ranks.

I. O. Rs.	2·12
Followers	2·50

This figure probably gives a somewhat erroneous idea of the relative mortality amongst this class of personnel because followers as a whole and the sweeper class in particular, tend to avoid admission to hospital until necessity compels, so that only the really seriously ill form the bulk of the admissions.

There is moreover the generally lower scale of *feeding* and *clothing* adopted for this class which does not enhance their powers of resistance when ill.

The Labour Camp and Hospital Quetta.

TABLE 91.

Consolidation of the monthly returns of the sick and wounded of labourers treated in Labour Camp Hospital at Quetta during 1939.

Disease.	Admissions.	Deaths.
Cerebro-spinal fever	1	..
Dysentery, Bacillary	2	..
Dysentery, exudate	..	..
Dysentery, protozoal	..	..
Dysentery, clinical	1	..
Typhoid fever	..	..
Typhoid fever, para A	1	..
Typhoid fever, para B	1	..
Typhoid fever, para C	..	..
Enteric group	..	..
Malaria	375	..
Oriental sore	37	..
Pneumonia (Lobar and Lobular)	8	2
Local injuries	66	..
All other causes	184	2
Total	676	4

Average strength of labourers *1,669.*

	Actuals.	*Ratio per 1,000.*
Admissions	676	405·02
Average daily sick	17·32	10·38
Deaths	4	2·39

The Labour Camp Hospital, Quetta, was closed on 31st August and thereafter the Labourers were treated in the Indian Military Hospital, Quetta.

Workers in Arsenals.—Special attention has been drawn and paid to the conditions of work for certain classes of employees in Arsenal Workshops. Improvements are being made in the work of Welders and Painters. The main defect in many places is that of " lighting on the plane of work ". This extremely important point for efficiency of production and prevention of accident is often grossly neglected partly from habitude, partly from want of attention, and partly from economy. A point which is certainly not recognised in India is that " you cannot get good work from bad lighting ". This applies to all classes of work and is particularly obvious in the numerous headquarters offices and stores of the Army in India.

PART I.

SECTION III.

SPECIAL SUBJECTS.

SECTION III.

SPECIAL SUBJECTS.

64. Hygiene

A. *Accommodation*

(*i*) The standard of accommodation in barracks and quarters of British and Indian troops has continued to progress.

Modern barracks both for British and Indian troops are definitely good and show attention to those details which improve the health of the occupants. The modern type of married quarter, both British and Indian, is also definitely good with modern sanitation available in the British type.

But during inspections it is noted and comment is often made that many barracks, many cookhouses or feeding places and many quarters are much below modern standards. This applies perhaps more particularly to the family lines of Indian troops and followers and the family quarters of British troops in hill stations. It is however a question of money and of relative needs in a district or command, and those who constantly urge new lines here or new quarters there should realise that relative needs must be judged.

(*ii*) *Overcrowding.*—An effect of the war was undoubtedly the overcrowding which had to be permitted. Movement of troops, arrival of reservists, return of large leave parties and influxes of batches of recruits all tended to cause very definite overcrowding, particularly in Indian lines. A watch was kept on the situation and appropriate measures taken by the medical authorities. In no case was there serious trouble on this account, and only in a few instances was overcrowding the cause of any special disease.

(*iii*) *New and old type buildings.*—During the year a set of experiments and observations was carried through in several stations to contrast the internal temperatures and feeling of comfort in the old and the new type of Barrack and Quarter. This was done in two phases during the hot weather and entailed many hours' work, even at night.

Owing to the diversity of factors involved the results were not conclusive but favoured the old type of barrack and quarter as being the cooler and more comfortable for summer use, having thick, mud coated, whitewashed walls with deep verandahs compared to the modern fashion of thin, red brick walls. The old type heats up more slowly, the new type cools quicker.

It was shown that relatively the orientation of the building was of real importance ; buildings so sited and protected by verandahs that they were not heated up by the early morning or late evening sun were more comfortable both for day and for night.

All food stores should definitely be placed on the shaded side of the building.

An outstanding factor which is often neglected is the cooling power of whitewash which can readily be shown to reduce temperatures by 10—15 degrees.

But for British personnel it is for consideration whether, as barracks and quarters are to a large extent vacated in the hot weather for the seasonal hill-move, barracks and quarters, bright, airy, well ventilated and open to the winter sunshine are not better than the old fashioned gloomy prison like structures of 30 to 60 years ago. It appears that provided adequate verandah protection can be given the modern type is really the better for our needs.

(*iv*) *Whitewashing of buildings.*—A special plea for the use of whitewash externally and, if suitable, internally is made with a view to the cooling of all buildings and to increasing their hygienic qualities. A well whitewashed wall is disliked by mosquitoes and flies and will not breed sandflies. A well whitewashed wall or roof has been shown to be 15° F. cooler than a one which is dark red, dark green or dark brown and 17° F. cooler than a black one.

An extremely useful and ingenious whitewash and colourwash is in use by the Military Dairy Farms in a number of places: Lucknow, Jubbulpore, Jhansi, etc., in which skimmed milk from butter making is mixed with the cement or whitewash producing a hard, cool, nonfriable surface which will readily resist the onset of the monsoon. Milk-cement wash is a method of treating the outer sides of all suitable buildings which is strongly recommended.

(*v*) *Reconstruction Quetta.*—This has continued steadily and many portions have been completed with subsequent clearing up of the builder's rubbish and broken material which so favour the presence of the pestiferous sandfly. The new type of jack-arch barrack designed locally for Indian troops appears to be very good. The new lines of the British troops are good.

The British Military and Families hospitals were opened during the year and are in many ways excellent. Experience has brought to light minor defects due in part to the effort to provide for the intense cold of the winter and heat of the Quetta summer. There are too many windows exposed to the sun in important technical rooms and the red concrete walls absorb considerable heat. Air conditioning of the operating theatre is satisfactory and similar treatment is needed for the gynæcological and labour theatres.

It is very obvious that for any future occasion every detail of every building should be critically reviewed from as many different points of view as possible: for example, clerestory windows which cannot be cleaned; mosquito proof doors which open inwards; a hospital with no communicating doors to the administrative block; operating theatres festooned with pipes, heaters and electric wires and a laboratory work room exposed to the direct morning sun.

B. *Anti-malarial methods.*

Each year's reports show with what enthusiasm and skill anti-malarial work is carried out in our military cantonments. Every aspect of the subjects receives attention from trained and alert anti-malarial officers who with their staffs work under the general direction of the S. E. M. O.

Occasionally criticism is heard that what is really needed for this or that cantonment is a complete malarial survey. But in the majority of stations the source of infection and of the infective mosquitoes is fairly accurately known already and now steps have been taken to place the accumulated knowledge of successive anti-malarial officers in book form as a record in each station. Orders have been issued for the maintenance of a looseleaf book embodying the whole of the antimalarial work, schemes, maps, etc., for each cantonment, so that this can be handed on from one generation of anti-malarial officers to the next.

Three main methods are now our standby in all cantonments; the extent to which each plays its part varies with the local circumstances.

(*i*) *Permanent drainage* with pukka drains is the ideal measure for any area and in our cantonments has proved its value as the succeeding years add to the amount which can be completed. The cost is heavy but is worth it, if the drainage is properly carried out. Some stations such as Rawalpindi,

Lucknow and Jhansi are already extensively provided with permanent drainage, in others where pukka drainage is lacking it is a moot point whether such drainage really has any bearing on the incidence of malaria.

(*ii*) *Mosquito destruction* in occupied premises is of paramount importance and for this the development of spraying with insecticide is proving of the greatest value. In many places it is the method of choice and the only practicable method. The method has the great advantage that it deals with mosquitoes, sandflies, flies, fleas and bugs, and that it can be applied to existence in barracks, camps, quarters or in the field.

(*iii*) *Personal protection* is the final main standby. Protection with the mosquito net is held by some eminent malariologists to be capable of preventing 95 per cent. of all infections. Unfortunately there are times when the standard pattern net cannot be used or even any net at all and in addition we have not yet succeeded in providing net protection for Followers who form a large part of our military population.

Every possible method is utilised in some station or other during the year; but in this report only those which have been specially in evidence during this year will be mentioned. But in assessing the value of any particular method factors such as the following have to be borne in mind.

A spleen census of school children carried out by the Health Department of the Punjab since 1914 shows that for the past 3 years malaria in that area has been abnormally low and that any decrease in cases in a cantonment is not necessarily due to the excellence of the anti-malarial work.

(*a*) Elimination of the " carrier " mosquito

(*i*) *Anti-larval methods and prevention of breeding. Permanent works and drainage.*—These have been continued as funds were available. The budget demand for these from all districts is still very large indicating how much remains to be done. Rs. 61,379 out of a budget item of Rs. 75,000 were allotted for this purpose during the year. Closure of unused wells and pukka drains for large nullahs have been a feature of the work. In many places properly constructed grassed banks with a central pukka channel is the method of choice.

Oiling of breeding places.—This has been continued, Malariol being given a full trial. The reports were satisfactory and Malariol will for 1940 replace the previous oil mixture.

Prominence has been given to the effectiveness of dealing with breeding places by spraying with pyrethrum spray solutions. Killing of larvæ is obtained in a few seconds over wider areas than can be done by oiling. The method is being progressively extended.

The " dry-day ".—This method is proving most useful in two ways; firstly that all potential sources of breeding in the cantonment are dealt with and secondly the " dry-day " tends to make all personnel in the cantonment anti-malaria-conscious.

The mosquito culprit.—Attention has been given to the mosquito actually concerned in the infection in the locality. *A. culicifacies* and *A. stephensi* share the honours in most areas, but interesting observations have been obtained in the Kohat and Quetta areas on the effect of the temperatures of the air and of the spring and irrigation waters in the preponderance of one species or another, A. culicifacies preferring higher temperatures than A. stephensi.

" *Sluicing* " *drains.*—This method has been developed for slow flowing drains at Abbottabad, Jhelum and Peshawar with excellent effect. It is an inexpensive method which shows good results.

Larvicidal Fish.—The use of these has been strongly advocated in a general circular and has proved successful in a number of cantonments. Remarkable results have been obtained in quite a number of stations : Poona, Lahore, Jullundur, Quetta, Jhelum, Lucknow, Ahmedabad, Hyderabad, Madras.

In this respect it is worth quoting from one experienced officer. "It may be stated categorically that no collection of water which will house fish should ever be oiled. Once they have been stocked with fish, these pools need only the minimum of supervision and make invaluable traps which no oiled pool is."

Gambusia (*affinis Holbrookii*) were used extensively in Kirkee and Poona. A stock pond was maintained at the Cantonment hospital. From this the Sholapur Road Quarry was stocked with 2,000 fish in 1939. Prior to this, this quarry was a perpetual source of anophelene breeding and cost Rs. 500 per annum for pumping dry the worst places after the monsoon in order to prevent further breeding. Since the addition of fish there has been no mosquito breeding and the ponds act as stock ponds for fish. The sisters' quarters swimming bath has been similarly treated and many wells, tanks, ponds and pools. All reports emphasise the value of these fish. They are hardy, breed rapidly, stand transport and handling well, they are worthless for food and difficult to catch without nets and so escape their cantonment enemies, including children.

At Abbottabad Chilwa appeared to be better than Gambusia and at Jhelum and other places Laubuca aptar (Ham) were found most effective. At Mir Ali and at Khajuri Barbus (Puntius) Sophore (Hamilton) was used with success.

In a recent conversation the Game Warden of the Punjab has made it clear that there are two families of fish indigenous to the Punjab which are good destroyers of mosquito larvæ ; these are *Tricogaster fasciatus* and an Ambesis, and the attention of anti-malarial officers is being drawn to these.

(*ii*) *Destruction of mosquitoes.—Spraying.*—This is now undoubtedly proving its real value. Introduced by us in Northern Command in 1935 as a universal method of defence against insect-borne infections, it is now in demand by medical officers and laymen throughout all cantonments.

A circular was issued drawing attention to the advantages of spraying in relation to other means stressing the fact that all insects are killed including carriers of malaria, dengue, sandfly fever, tropical sore, and the dysentery-diarrhœa group. Also the fact that this affords the one successful method of cutting short an epidemic and that it is a method applicable to the spot in which the troops are actually living.

All reports emphasise the value of pyrethrum sprays. Pyefly solution has been the main standby, but Pyrocide 20 and Lethane have their advocates. Unfortunately the cost of commercial Pyrethrum extracts is very high and in many cases the money spent goes out of the Empire. Lethane is cheaper and held by some to be more effective. During the year arrangements have been in progress whereby we will buy our pyrethrum flowers direct from the Empire source of Kenya and manufacture in our own Medical Stores Department. These arrangements have now been completed for 1940. The cultivation of Pyrethrum in Kashmir and India is also under way.

Kenya flowers contain 1·4 per cent. or more of pyrethrins where as Japanese flowers contain only 0·5—0·7 per cent. pyrethrins. Kashmir flowers which have been examined are stated to contain 1·4 per cent.

It was found that men working with lethane sprays suffered from acute irritation of conjuctivæ, of mucous membranes and of the hands. Though apparently harmless the irritation does definitely occur.

Experiments have shown that ½ oz. of 1 in 75 Liq. Extract of Pyrethrum or 1 in 33 Lethane freshly prepared in 3rd quality kerosene was required for each 1,000 c.ft. of space for killing all mosquitoes. It was also shown that the carbon tetrachloride, petrol and even citronella could be deleted from our original mixture.

In all stations definite spraying programmes are carried through for barracks, quarters, offices, followers-quarters and even trains. The demand is great and entails heavy work by the anti-malarial and unit squads, but so obvious are the results that units willingly co-operate.

The ordinary hand spray-gun and various types of portable sprayer have been employed. A new robust hand sprayer devised by the Malaria Institute of India has been manufactured, but has not yet reached complete success.

Six Phantomyst machines were purchased for various stations and reports on their use through a season have been received. The reports indicate that when they are working they are good; but they are under-engined and mechanically defective and therefore usually not working. For large, closely grouped barracks they are useful; but they are not really suited to our universal needs.

Oily plate.—This is a method much in favour in many stations and phenominal catches have been reported, *e.g.*, at Sialkot two million mosquitoes were caught by this method in 7 months; 800,000 in September alone; at Multan some 90,000 in one month. The bulk, of course, are culicines but many hundreds of anophelines are killed by this means.

The oily plate method is also of value in indicating the direction from which mosquitoes are coming. At Razani camp, outside which no work could be done, the arrival and spread of anophelines from certain villages into and through the camp and the subsequent tide of malarial cases was clearly shown by this oily plate method.

Traps.—The black cloth trap placed in a frame work is found to be most effective and is much in use.

(*b*) *Methods of protection.*

(*i*) *The mosquito net.*—This forms the safest protection provided it is used whenever possible. Failure to use nets during the infective autumn period after the declaration of war was reported on a number of occasions and was undoubtedly the cause of a great many unnecessary admissions for malaria.

The B. net (Bivi type) has been used successfully on the frontier and a universal pattern has been evolved which will function either as the single rectangular pattern or as a bivouac net.

A policy was laid down as to mosquito proofing of buildings namely that this method of protection would not be considered except in very malarious places where external measures could not be made effective.

From Wana it is reported that the warping of the woodwork used in mosquito proofing had been so extensive as to render the proofing useless until considerable repairs were carried out.

(*ii*) *Anti-mosquito cream.*—This, which was introduced by us for the 1937 Waziristan operations, has been taken into universal use throughout India.

Arrangements have now been made for issue of filled cream containers on a 25 per. cent basis for all troops and of the cream itself on an as-required scale to all military personnel and their families, to troops on the move, to families travelling, to touring officers and to all personnel proceeding on leave. Containers may be purchased full of cream at 3 annas each by all military personnel not entitled to the free issue.

(c) *Removal of reservoirs of infection. "Prophylactic treatments."*

(*i*) Treatment of new arrivals, returning leave men, called up reservists, etc., forms a method which has been successfully employed. This method is of use on two counts in that potential malarial patients are forestalled by a full course of treatment and secondly chronic infective foci are removed from the lines before they can pass on their parasites to the local mosquitoes and to their fellow men. A full treatment is much more satisfactory than a half-hearted truncated course.

The following observations by an experienced officer on the subject of malarial infection and enlarged spleens is worth recording from a Frontier station.

1. Moderately enlarged spleens disappear in the cold weather, reappearing in ever increasing numbers from March onwards. The appearance of enlarged spleens from apparently nowhere and at a time when there are no mosquitoes was a disconcerting feature.

2. If untreated, these spleens increase in size, fluctuating from time to time.

3. Enlarged spleens retreat under treatment only to reappear again on discontinuing treatment.

4. Marked fluctuations in size occur frequently under treatment so much so that I suspected my palpating hand in the earlier days.

5. I frequently picked out men at Medical inspections who had fever with parasites in their blood. These men stated that they had no complaints and felt well. Hence it would appear that the number of admissions to hospital may not truly represent the malarial state of a garrison. It may also explain why one comes across enlarged spleens with no previous history of an attack.

I am inclined to believe that for each admission to hospital there is at least one " sub-clinical " case in the lines.

(*ii*) The treatment of Followers and particularly of women and children at Welfare Centres and Indian troops family hospitals has also been noted as having a definite anti-malarial effect.

Unfortunately we have not yet been able to provide Followers with net protection though trials of a less expensive net for this purpose are under way.

An indication of the relative safety of cantonments is given by the following Spleen Index figures taken in an area of average endimicity.

	Percentage enlarged spleens.
Indian children in cantonments	7·8
Indian children in villages just outside cantonments	29·0
Indian children in surrounding districts	45·0

(*iii*) In co-operation with the civil authorities some progress has been made in a few places, but the ever present fear that co-operation will entail expenditure from local civil funds is usually the stumbling block to achievement.

(*iv*) *Prophylactic treatment.*—This was given a serious trial with controlled personnel in two areas under good medical supervision. The name has been changed to anticipatory treatment but the results are much the same as they were under our previous name of " delay action quinine " although in the present case the drug used was Atebrin.

Report on trial of Anticipatory treatment of malaria by Atebrin.

Wana.—410 men from various units were selected for treatment and a similar number of controls. Their conditions of life and work were similar.

Treatment was commenced on 1st June and stopped on 15th September. It consisted of 0·1 grm. atebrin on 3 consecutive days each week, and no other drugs were given to men of either group during the period.

22 of the men under treatment lapsed from the experiment due to transfer or absence from the station or *development of malaria during the course.*

No effects of intolerance were found.

A *red ink* entry was made in the Medical History Sheet of all men of both groups stating that they had been employed in this trial and notification of any admission for malaria up to June 1940 should be sent immediately to the Officer Commanding, Combined Indian Military Hospital, Wana. By this means a follow-up should be ensured.

Damdil.—Similar observations were made here but the control of conditions could not be so thorough or continuous.

Conclusions.—The anticipatory treatment seems to be fairly successful in keeping personnel fit for work *while the treatment is being continued.* Only 5 cases of the treated group as against 10 of the control group developed malaria during the trial period up to the 15th September. But subsequently 11 of the treated group and 14 of the control group developed malaria up to the 31st December. That is 16 of the tested group as against 24 of the control group developed malaria between the 1st June and 31st December.

The final report will be issued next year when the " follow-up " to June 1940 has been completed.

(*d*) *Training of anti-malarial personnel.*—This has been continued. The courses given by the Malarial Institute of India have proved invaluable to Officers. In addition to 4 Officers, arrangements have now been made for Military Sub-Assistant Surgeons to receive similar training. The anti-malarial squads of stations are in many cases now highly trained. In some stations a reduction of expense and possibly better results are obtained by utilising men from units in place of cooly labour. The former can work in barrack lines, quarters and bungalows ; the latter can only do so under supervision and with permission. But the use of fully trained fighting men for work which others can perform is not necessarily a real economy.

C. *Civil Authorities—Co-operation—Joint Sanitary Boards.*

Various districts, particularly in Northern Command, report that some progress has been achieved, though slow. Co-operation is best achieved in anti-malarial measures, but even in this it is difficult to get the *co-operation* of all the civil authorities concerned, *e.g.*, the irrigation authorities at Peshawar have failed to join in the *co-operation* of the other civil authorities.

Co-operation between Military Hygiene Officers and Civil Health authorities has been sought by a memorandum issued by the Central Advisory Health Board at a meeting held in Madras. Lists of names and appointments were circulated to indicate the corresponding officers between whom liaison should be established. It has been chiefly left to the Military health officers to initiate any co-operation which has been achieved.

Comment is made by our hygienists that in practically all cases the scheme is due solely to military initiative, still depends on military drive and owes nothing to civilian energy. In Northern Command 15 fully organised co-operation committees are now in being ; but the main barrier to real progress is the unwillingness to provide money for obviously necessary schemes.

Military Medical Embarkation Officers at Madras, Bombay, Calcutta and Karachi have been appointed to perform *ex officio* the duties of Port Health Officer in respect of all troop ships.

D. *Dairies.*

In the Government Military Dairies Service we have an institution which is steadily improving, which yearly proves more and more valuable to the Army in India and which is responsible in no small measure for the improvement in health in military cantonments.

A very high standard of hygiene is maintained which contrasts well with other uncontrolled supplies which unfortunately the power of vested interests can still maintain in various cantonments.

In many stations all the Indian units now take their supply of milk from the Military Dairy. British families also are becoming more sensible in this respect though the temptation of credit and *lower prices* of the local gwalla is often great.

Excellent new dairies have been completed at Lahore, Sialkot, Peshawar, Meerut, Wana, Jubbulpore, etc., and are in building or under improvement at other places. For stations where dairies do not exist depots provide the supply, such as at Bareilly, Abbottabad, and Bombay, with good results.

In Southern and Eastern Command small pasteurisers are provided in a majority of the dairies to deal only with small quantities of milk. Large pasteurisers to deal with the whole output have not been installed. The policy of putting such large pasteurisers is now being steadily pursued as funds become available, but the cost is very high and has been more than doubled since the onset of war. Provision will therefore be only gradual.

Other dairies.—In cantonments these vary from moderate to frightful; but full control is difficult except when an epidemic gives a lever to exert pressure. The ever present danger however is the local gwalla who peddles his dirty and adulterated wares round married quarters and small messes. A good example of the damage which can be done is quoted in paragraph 76 in relation to the milk-borne outbreak of dysentery at Cliffden near Murree.

E. *Field Hygiene and Sanitation : Training and Inspections.*

Special attention has been paid to training of Officers and men in field hygiene, particularly in Northern Command. Special training has been given to short service officers by Deputy Assistant Directors of Hygiene of Districts.

The question of provision of training facilities in the shape of Field Hygiene demonstration areas has been taken up. Some years ago these were established in a number of stations, but they had been allowed to lapse through neglect and were practically useless. Arrangements have now been completed.

for provision of a suitable training area in each brigade station and for the use of these as part of the general training of units and for their maintenance from training-grant funds. Demonstration areas are already being established at a number of stations : Lucknow, Karachi, Jhelum, Sialkot, Peshawar, Jubbulpore and so on. In addition in each Command pamphlets of instruction have been revised and issued to all medical officers.

To reach its proper place in the training of all personnel training in field hygiene must be treated as a part of the normal training programme of the year. It is hoped that by the means mentioned above satisfactory results will now be obtained.

Rest camps and training camps are often the obvious source of infection and admission to hospital of quite large numbers of men. Special attention has been directed to the use of all available preventive measures in such camps as a means of conserving man-power and preventing waste.

F. *Food and its control.*

This has been receiving special attention during the year particularly since the commencement of war which has called for large demands from unusual sources and new types of materials or foodstuffs.

The routine inspection of food supplies and of issues has been very thorough and a most excellent supervisory control is maintained through the Director of Contracts, Director of Supplies and the Military Food Laboratory, Kasauli.

Few people, other than those intimately concerned, realise what a valuable part this Food Laboratory plays in the maintenance of our high standard of foodstuffs for the Army. A summarised report of the work done through the year is given below and conveys some idea of the scope of the work covered. This work includes the control of ghi supplies which are prepared at the Ghi Heating Centre at Agra. Throughout the year and particularly in the last 4 months after the onset of war this laboratory under able and highly skilled personnel has examined and checked samples of supplies of all kinds. At times the checking may appear to be severe, but there is no doubt that the slightest relaxation of control or standards means immediate deterioration of quality.

(*i*) *The Military Food Laboratory, Kasauli. Summary of work carried out during 1939.*

(*a*) There has again been an increase in the work done during the year, a record total of 20,328 samples having been examined. The total includes work done at the Ghi Testing Laboratory, Agra.

The following table gives the figures of the previous three years :—

TABLE 92

1936	13,058
1937	15,320
1938	18,012

There was a rush of work soon after the declaration of a state of emergency. All this large amount of work has been achieved without additional staff but at the expense of considerable strain on the existing staff who had already been working increased hours. To cope with the increasing work the necessity for augmenting the staff was keenly felt and necessary action is in hand.

The laboratory has proved its usefulness and importance beyond doubt on many occasions throughout the year.

TABLE 93

Summary of samples received, accepted or rejected

Source of sample.	Percentage of rejections.	No. of samples received.	No. of samples accepted.	No. of samples rejected
1. T/(*a*) For registration of contractors—				
From abroad . . .	27·8	36	26	10
From India . . .	42·3	584	323	247
2. T/(*b*) For tenders from approved firms—				
From abroad . . .	30·2	63	44	19
From India . . .	30·1	468	317	141
3. T/(c) For special report to the Director of Contracts—				
From abroad . . .	28·2	85	37	24
From India . . .	38·8	1,047	669	406
4. A. For check before final acceptance of bulk supplies—				
From abroad . . .	..	221	221	..
From India . . .	12·1	2,257	1,984	273
5. C/(c/e) Emergency supplies purchased without prior reference to the M. F. L.—				
From abroad . . .	..	86	86	..
From India . . .	..	19	19	..
6. H. Samples of articles submitted by medical officers not R. I. A. S. C. supply.	7·8	128	44	10
7. D. Supplies received from sources outside India, I. S. D., London.	..	1,041	1,041	..
8. W/P. Samples from Government controlled mills.	..	650	650	..
9. C/P. Samples for comparison with local prices.	5·0	40	16	2
10. G/BS. Samples of grain from bulk.	..	584	584	..
11. G/SA. Samples of grain set aside by agents.	12·6	246	197	31
12. G/A. Samples of grain for approval.	1·1	643	624	7
13. G/GR. Samples of grain issued to supply depots.	0·1	1,378	1,377	1
14. C. Samples of complaints from source.	13·8	1,548	1,260	213
15. C/(c/b). Samples received from Army in Burma.	..	2	2	..
16. R. Comparison samples of ghi from Ghi Testing Laboratory, Agra.	..	86	86	..
17. Samples of ghi analysed at Ghi Testing Laboratory, Agra.	..	6,127	6,127	..
18. T/Y. Samples from stocks half yearly.	1·8	2,932	2,602	54

NOTE.—In certain cases no report was rendered. Some were " repeat " samples.

(*b*) The main causes of rejection under the three groups T (*a*), etc., were mainly :—

From abroad.—The stock old, or incorrect and unsatisfactory pack.

From India.—The fact that Indian manufacturers have not as yet realised the quality and pack required, show lack of business

acumen and fail to realise that a specification is meant as a standard and not merely as a guide and that standards must be maintained beyond the original sample.

The articles affected were :—

From abroad.—Milk tinned, jam and cornflour.

From India.—Rice, sugar, lime juice or lime juice cordial, jam, pickles, chutneys, vinegar, tobacco B. T., oil cooking, biscuits fancy, rum, flour.

With the above exceptions, and tinned-butter, cheese, and fruit, and sauce table, there exist in India adequate supplies of indigenous foodstuffs.

(*c*) *Group A.*—Is the check maintained on bulk supplies before final acceptance and indicates the real quality of the articles available for supply.

The samples from abroad were mainly from Australia and continue to be of excellent quality with no rejections.

In some of the Indian products appreciable improvements have been effected but some continue to be unsatisfactory, *e.g.*, Rice, Sugar.

(*d*) *Under Category H.*—Are miscellaneous samples (except water and sewage) sent by various civil and military authorities and are not articles of R. I. A. S. C. supply.

It is the first time that an accurate report under this head has been made available and some of the samples were unusual, *e.g.*—

Halwa (*sweetmeat*). } For arsenic contents to be traced but
Vomit (*tongue and tomatoes*). } none was found.

Canvas.—For indigenously manufactured canvas for water tanks. A satisfactory proofed cotton canvas was evolved.

Zaldecide.—An insecticide to ascertain its composition.

Unknown substances.—A number of samples of " secret " remedies were sent to A. H. Q. after the outbreak of war, by various Indian gentlemen. Examinations revealed that the articles were not of any therapeutic or food value, *viz.*, Gum Tragacanth, Dried leaves, Animal Charcoal and a sure cure for Malaria—found to be (Sodium Chloride) Common salt.

Powder from Ice.—For suspected foul play—contained nothing more than Calcium Carbonate.

Oil cooking.—For Stallions for increasing their fertility—identified as cotton-seed oil.

(*e*) *Groups D. W. C. G. & T.*—Include samples which control actual bulk supplies obtained through the India Stores Department or those of Government controlled mills and of whole or crushed grains, dhalls, atta, etc. The general results continue to be satisfactory. In particular the complaints in respect of I. S. D. supplies have been entirely eliminated and in most cases these have outlasted their warranty. The system introduced last year of a second examination at the port of arrival is responsible for this improvement.

(*f*) *Emergency supplies.*—To meet emergent requirements of supplies for forces overseas and in India, certain articles have had to be purchased from Australia and India without prior reference to the Laboratory. Such articles are classed under " C/E."

In a number of cases the articles did not conform to R. I. A. S. C. specifications but the defects were not such as to render them unfit for issue.

With the exception of Bacon all articles purchased from Australia were satisfactory.

(*g*) The table above does not include the following two categories :—

Category " W ".—" Water"—Sewage and water analysis samples.

No. of samples.	Water.	Sewage effluent.	Sewage.
	27	6	5

Category " K ".—Development of indigenous supplies

The number of samples received, upon which special reports were issued, was 19.

This category was devised to provide a complete record of samples submitted through the Department of Supply or by firms direct, during the period immediately after the commencement of war but has since been discontinued.

(*h*) *Special work and Research.*—The vitamin " C " work was completed and it was established that Ascorbic Acid tablets manufactured by Messrs. Glaxo, Ltd., were active both chemically and biologically. Further work was also done on Vitamin " B " and the Vitamin " B-complex." " Vegetime," " Bovite," and " Thiamax " were examined biochemically and found to be active. Lengthy analysis and investigations were performed on certain articles.

(*i*) *R. I. A. S. C. Specifications and M. F. L. Pamphlet.*—As a result of the issue of revised R. I. A. S. C. Specifications, in which the pamphlet is now embodied, a great deal of unnecessary work and reduplication of reports has been stopped.

Certain slight defects in the procedure have come to notice and these are being remedied.

(*k*) *Ghi Testing Laboratory—Ghi Heating Centre, Agra.*—The ghi issued from the Centre this year has been of high quality throughout. The maintenance of a " 9.0 point " acidity limit, will undoubtedly remove all complaints of " over-acidity ".

The usual high standard of technical ability and efficiency has been maintained.

The number of samples was 6,127. There were no rejections for high acidity. 92 samples had to be re-heated.

(*ii*) *The Quality of Ghi.*—The acidity of Ghi is always a very vexed question on which the price and supply is based. Army supplies are bought from certain firms and centralised for blending, purification and packing at the Ghi Heating Centre at Agra. Quality is strictly controlled for every batch by repeated sampling at the Laboratory attached to the Centre. The work done by this Centre and Laboratory is of immense importance to the Indian Army and to the Indian soldier. One of the main difficulties about Ghi issues is the rise in acidity during the periods over which it is kept, particularly in hot weather. Blending of stocks of ghi of various acidity is utilised to produce a final acidity down to a specified figure.

This specified figure of acidity is given in " points " in relation to the percentage of fatty acids present, considered as Oleic acid. The figure selected for maximum acidity when the ghi leaves the Centre is 9 points, and 11 points of acidity was considered to be the maximum for issue to troops

Owing to certain circumstances very large quantities were held in stock of which the acidity was found to be 12—14 points. In the open market acidity is often higher than this. It was therefore decided that the absolute maximum limit of acidity at issue should be raised to 14 points to save waste of stocks, but that the 9 points limit should be retained at the Centre and 11 points as the normal upper limit.

In the meantime a close watch would be kept on troops receiving these relatively high acidity Ghis to note any harmful effects.

Reports received at the end of the year show that there have been no harmful results up to date from issues of Ghi of an acidity up to 14 points and that the decision to avoid the waste of large quantities was fully justified. It should be pointed out however that issue of high acidity ghi over long periods might show a very different result. The results of mal-nutrition are always slow in manifestation and the results of a short observation would not justify any permanent departure from established standards.

The method of standardisation and of recording our Ghi is as follows.

(*iii*) *The standardisation of Ghi.*—The methods of stating the standard appear to vary in the different Provinces. The military method which is employed by the Government Agent and his analysts is to state the acid value in terms of " points ".

By " points of acidity " is meant the number of millilitres of N/10 standard alkali solution required to neutralise the fatty acids in 10 grammes of the dissolved fat (indicator being phenophthalein).

The figure obtained may be recorded thus :—

(*a*) Converted to indicate the proportion of free fatty acid present in the Ghi in terms of a particular acid.

(*b*) Converted to indicate an " acid value " in terms of the number of milligrammes of potassium hydrate required to neutralise the free fatty acids in one gramme of Ghi.

(*c*) Recorded directly in " Points ".

(*a*) and (*b*) are scientific, are legal, but are puzzling to the trader.

(*c*) is simple and legal if properly defined by declaring the proportion of oleic acid represented by the point.

The appended table shows the value of fat in terms of points. " Under 9 points " compares almost exactly with the " acid value " of 5.

TABLE 94

ml. of N/10 alkali solution neutralizing the free fatty acids in 10 grms. of ghi.	" Points of acidity."	Derived from Column 1.	
		" Acid value " (mg. KOH neutralizing the free fatty acids in 1 grm. of ghi).	Percentage of free fatty acids in terms of oleic acid.
1	1	0.561	0 28226
2	2	1·122	0·56452
3	3	1·683	0·84678
4	4	2·244	1·12904
5	5	2·805	1·41130
6	6	3·366	1·69356
7	7	3·927	1·97582
8	8	4·488	2·25808
9	9	5 049	2 54034
10	10	5·610	2·82260
11	11	6·171	3·10486
12	12	6·722	3·38712

(*iv*) *Inspection of Sources of Supply.*—During the year it has become the practice that all firms applying for contract to supply articles of food shall be inspected by the nearest D. A. D. H. before the Supplying firm is accepted. This method has proved of definite value not only to us but to the contractors who have received advice as to necessary improvements in the hygienic condition of their premises.

(*v*) *Measley Beef.*—Trouble has been experienced with this at Quetta Karachi and the stations of the Southern Command. This has necessitated careful control of meat supplies.

(*vi*) *Ascorbic acid tablets.*—These were fully tested out at the Military Food Laboratory, Kasauli, during the early summer to check the vitamin "C" content. The results were satisfactory, after preliminary failures due to local and climatic causes. These have now been finally introduced into the field service ration.

(*vii*) *Messing.*—Considerable attention has been paid to this and reports of the Inspector of Catering are carefully studied by medical administrative officers. Difficulties are now arising in the increased cost of food stuffs since the onset of war. Since the increase of the ration allowances units have been able to provide excellent and ample dietary without any "extra messing charge". The present increased cost will mean either an increase in allowance, a decrease in the quantity of food which can be purchased, a decrease of the rebate paid by the contractor or an increase in the free ration.

G. *Ordnance Factories, Workshops and Industrial diseases*

At the beginning of the year instructions were issued for Hygiene Officers to watch for the occurrence of cases of industrial disease in Workshops and Ordnance Factories and to comment on these in their reports.

In the majority of cases no evidence of such diseases came to notice, but with increasing industrialisation and its effects on skilled labour such diseases will undoubtedly become common. Even now cases of lead poisoning from paint shops are occasionally reported.

In Lahore District it is reported that during the emergency period signs of strain were not lacking and defects in lighting on the plane of work became obvious. Shaded bench and table lights are needed in many places.

The Clothing Factory at Shahjahanpur doubled its working staff and employed work shifts day and night without any outbreaks of disease. But here the question of adequate lighting was the subject of special reports.

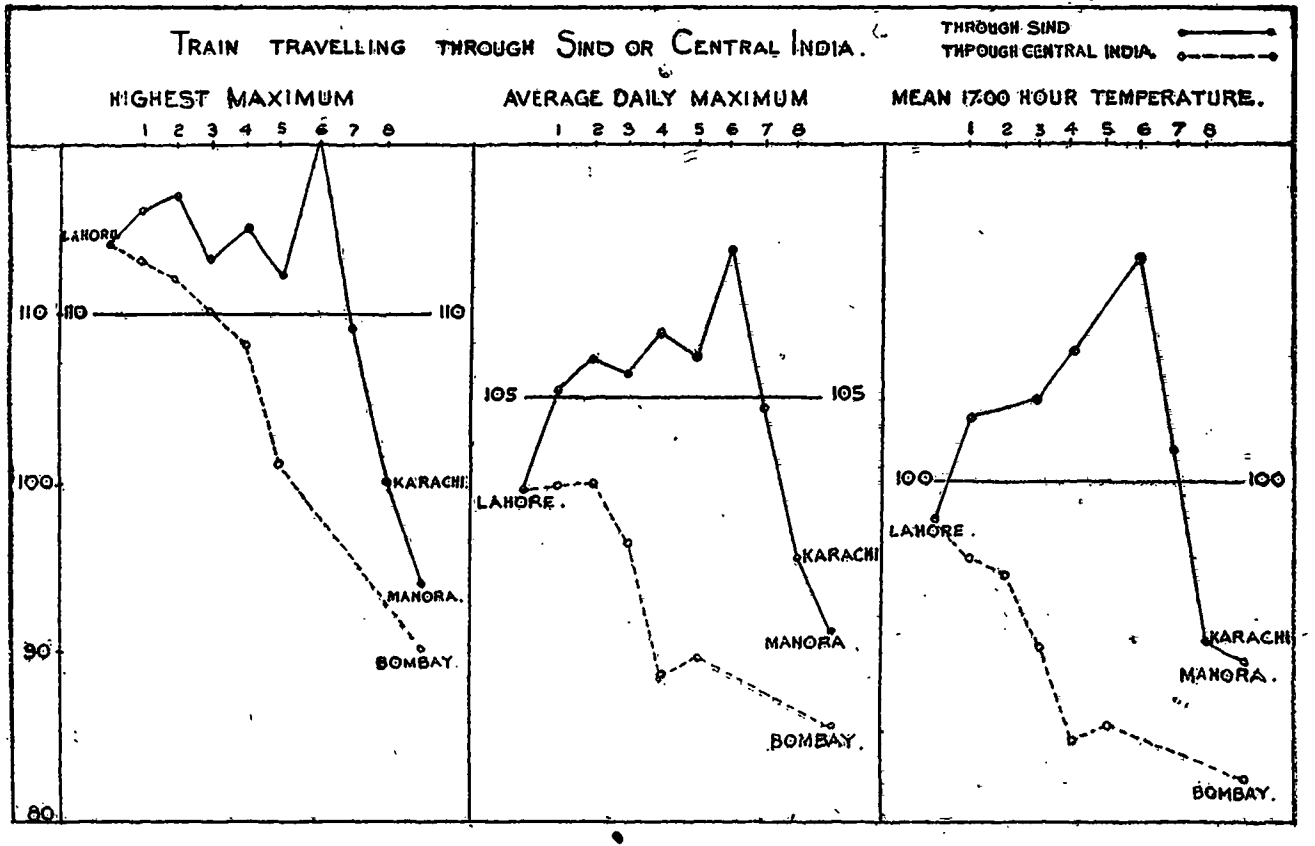
This question of adequate lighting on the plane of work is one which is obviously neglected throughout private and public workshops and offices in India.

H. *Hot-weather Precautions*

(*i*) Owing to the great increase of movements necessitated by the general situation special measures have been needed to safeguard all types of military personnel travelling throughout the hot weather, a time during which under normal circumstances movement is severely restricted because of the dangers from heat.

The arrival and departure of Transports have continued throughout the hot weather season, well beyond normal trooping periods. This has meant the conveyance of troops and families by train through the length and breadth of India under hot weather conditions. With special precautions as to times of journeys, meals and the provision of ice this procedure has been successfully

CHART No. XII.



NOTE:- AN APPROXIMATE DANGER ZONE IS SHOWN FOR EACH TYPE OF TEMPERATURE.

carried out. Records throughout journeys were kept by the officer in medical charge and graphs prepared for each journey. Journeys through the Sind Desert to Karachi were not accepted owing to the intense heat on this section of railway where *Mean* temperatures of 86° to 110° are experienced in June to August.

From a consideration of shipping facilities and the stations from which troops would move the subject of the journey to Bombay or to Karachi became important. The advantages of the Bombay route in relation to temperatures encountered during the journey are shown by the graphs given below. These refer only to June, but similar differences are shown for the months of July and August. The hours spent in a temperature over the danger mark for Heatstroke are lengthy on the Karachi route and short on the Bombay route.

Very special precautions were taken in respect of troops and families such as ample supplies of ice, one maund per compartment and five maunds per troops carriage twice daily : proper provision of fans : provision of ample drinking water : spraying of all compartments on the train as an anti-insect measure with pyrethrum solutions before occupation : entrainment as far as practicable early in the morning or at least shortly before departure : the proper spacing of meal hours and provision of meals suitable to requirements.

In Waziristan District the special danger is the " Heat-Stroke Express " which runs at some 10 miles per hour from Mari Indus to Manzai. Ice blocks were issued to British troops and hand fans provided. There was one British case of heat exhaustion.

Throughout the season there have been practically no adverse results from these hot weather journeys.

(*ii*) *General management.*—With the more reasonable management of troops, British and Indian, during the hot weather the fetish of early rising and close seclusion in barracks during the day is being stopped.

Later reveille, feeding adapted to the season, ample supplies of cooled drinking water, exercise and employment out of droors or indoors throughout the day, and minimum clothing are all methods now being successfully employed during the hot weather to keep men fit.

(*iii*) *Extra Salt.*—The increase of sweat during hot weather means an increased loss of salt which over the hot weather period will amount to a serious drain from the body. The loss per day in really hot weather is estimated at nearly half an ounce, whereas the normal day's ration contains only one quarter of an ounce. Unless this deficit of nearly a quarter of an ounce is made good the bodily tone is bound to decrease.

Issues of extra salt have been made in several hot stations over the past 3 years, originally w th a view to preventing prickly-heat and the subsequent boils. The results were not considered conclusive but the opinion has been expressed that there is a marked general improvement of bodily fitness, the extra salt is definitely appreciated and the extra salt has a very definite effect in prevention as a prophylactic treatment for heat exhaustion and heat stroke of which examples are quoted.

(*a*) Voyage reports from ships travelling through the Red Sea during the hot weather specifically mention the absence of cases of Heat stroke and Heat exhaustion and attribute this to increasing the salt intake for each individual by increasing the salt put into all the food during cooking.

(*b*) *Extra issue of salt.*—Further experiments carried out in 1939 appear to show that an extra issue of salt was of definite benefit in the case of Indian Troops, as the following statistics indicate :—

TABLE 95

Ratios per 1,000

	Average strength.	Prickly heat.	Boils.	Headache.	Constipation.	Heat Exhaustion.	All causes.
On extra salt .	4,426	0·45	34·79	5·65	17·62	1·13	350·88
Without extra salt .	4,482	2·90	44·62	3·35	19·63	7·14	415·22

It should be noted that the subjects of the experiment were in different stations. The conclusions are therefore apt to be misleading.

I. Sanitation in Cantonments and Barracks

(*i*) In spite of many improvements over the past 30 years and in spite of repeated attempts at modernisation in many stations the disposal of excreta, of sullage water and of refuse has remained primitive and more in keeping with camp sanitation that that required for modern barracks. This is partly because such methods are understood by the class which deals with conservancy and refuse disposal and the old methods of disposal go on from one generation of inhabitants to the next, partly because the introduction of modern sanitation, though probably cheaper in the end and though certainly more satisfactory in its results, needs the outlay of capital funds, an outlay against which so often stenuous objection is raised.

However it is pleasing to note that in some cases at least a visit after some 15 or 20 years shows actual changes for the better, even in the more primitive methods of sanitation.

(*ii*) *Sewage disposal.*—In quite a number of stations now modern sanitation and methods of refuse disposal are being steadily introduced with appreciable benefit. In some, such as Quetta, Poona, Calcutta, Delhi and Bombay a full type of sewage disposal is provided ; in others local water borne sewage to septic tank and final underground disposal is found to be more economical. This type is now being provided for all new quarters and for lines as occasion arises. In Quetta the D. A. D. H. has inspected after test some 1,000 pipe lines and manholes.

In Sialkot this septic-tank-subsoil-disposal has been taken into use to deal with the night soil and urine from group latrines. The method consists in providing duplicate septic tanks with a capacity of 1 foot run per seat, having a width of 2½ and depth of 4 feet. A dumping hopper closed by a sloped metal cover and protected by a glazed pipe water-seal leads to the septic tanks. Effluent is dealt with by means of subsoil irrigation into agricultural pipes placed over channels of 2 to 3 feet of broken brick. The disposal channels are firmly covered in and are provided at about 15 ft. run per seat. It is essential that not less than 5 gallons of water per seat per day

should be used for flushing. The method is proving a success and will be introduced to other commands.

The Sewage works at Quetta.—Parts of the purification plant have been redesigned to provide from one old settling tank a sludge digestion chamber, improvements have been made in the filters and in the final disposal of sludge and effluent.

The Sewage project at Wana had a setback owing to the fact that subsoil irrigation in the Wana soil appears to be incapable of dealing with the effluents from the septic tank disposal plants. Regretfully the pail and incineration were reintroduced.

The Sewage project at Thal.—A new sewage disposal plant for the new buildings had been devised and would have been a great advance in benefitting the station. Sanction had been accorded but the war broke out and so pail latrines and incineration have been provided for barracks and septic tank disposal for all bungalows and quarters.

Septic Tank disposal of effluents from hospitals.—This question was raised by the Engineers in connection with building septic tank disposal plants for hospitals from which disinfectants were emptied into the drainage system. Carefully checked enquiries were made. These included a series of laboratory experiments and full scale tests which were extremly well done by R. A. M. C. Officers at three of the largest military hospitals near which a district laboratory was available.

It was shown conclusively that in the normal sewage effluent from a hospital the dilution was quite sufficient, 500 to 1, to eliminate any inhibitory action, by the disinfectant. A 300 to 1 dilution appears to be sufficient, the average hospital dilution is 1000 to 1 or more.

The question of size of the septic tank was also raised and the conclusion reached that for military hospitals a 1 day's capacity at 30 gallons per bed per day should be given, the tanks being 3 to 4 times longer than broad and not less than 4 feet deep with 1 foot extra depth to allow for sludge. When only the water closet and slophopper sewage goes to the septic tank system 12 gallons daily should be allowed with a 50 per cent addition in relative size.

Sewage effluent disposal.—At Quetta complaints had been received and difficulties raised by civil authorities on the disposal of sewage effluent from the military sewage works into the Lora River (a method of disposal common in all countries). In order to refute objections and serve as a record for the future careful examinations kept during the year showed the following :—

The Sewage effluent was at all times good and except in August was actually of better quality than the Lora River water.

The Lora River water was typical of that of an open stream freely contaminated and was except in August of worse quality than the effluent.

The Habib Nulla, a typical drain nullah passing down between cantonments and the city to finish in the Lora River, was always grossly contaminated and of very bad bacteriological quality.

It was quite obvious that the discharge of our sewage effluent could have no harmful effect on this river water.

Conservancy at Aurangabad.—At Aurangabad conservancy is carried out efficiently by motor transport—separate lorries are available for rubbish, night soil and sullage.

Latrines for families quarters and for followers.—At present there are two arrangements. The single latrine to every quarter and the group latrine for

blocks of quarters. There is no question but that the best type for military and cantonment health in general is the Group type of latrine which is fly proofed. This must however be close at hand to the quarters otherwise the whole object is defeated; also if close at hand the latrine is likely to receive the better supervision.

Group latrines of this type are being provided for new constructions.

(*iii*) *Cantonment sanitation schemes and general control.*—In many cantonments attention is being paid to the need for a definite scheme for sanitation. For example, in Northern Command, the D. D. M. S. has arranged that a 10 year plan should be drawn up for each cantonment in the hope that some lasting results may finally be achieved. It is estimated that the normal minimum sanitary improvements would cost in a small cantonment one lakh of rupees and in the large cantonments two lakhs.

Anti-plague measures.—These were continued in Poona at the cost of Rs. 2,000 and the scheme carried through as in previous years. Definite value for money and time expended is claimed for the scheme.

Private bungalows.—The compounds of bungalows whether occupied by officers or civilians are a constant source of trouble in cantonments. In many cases unauthorised dwellers in servants quarters are the greatest offenders and are the source of epidemics and infections. These require strict control and supervision. Attention is being given to this matter.

Trenching Grounds.—At Jhansi progress has been achieved in that agreement has been reached for the municipal trenching ground to be moved away some two miles further from barracks. This should have a definite effect in reducing the present high rate of admissions for dysentery.

Hotel and Boarding house sanitation.—There have been several outstanding examples of single cases or multiple outbreaks of intestinal infection, usually dysentery, in fashionable and expensive hotels at which numbers of military officers were living. In one case after the occurrence of typhoid infection, a condition was found in the kitchen of the leading expensive hotel of a large town in the north which would fully have justified placing the hotel out of bounds to all military personnel.

Unit lines.—As a whole the sanitation within unit lines is of a good standard. Naturally these vary, but it is quite evident that permanency of tenure such as enjoyed by a Training Battalion makes for much better general sanitation than is obtained when units are liable to frequent moves.

(*iv*) *Fly-proofing.*—Progress is gradually being made in providing fly-proofing for kitchens, dining places, cookhouses, and food stores. Complaint is often made by many medical officers of the lack of fly proofing for latrines of Indian troops. A further point is made of the presence of large numbers of open menial-latrines in cantonments whereas British troops latrines are fly-proofed. In view of the second point and the other numerous sources of infection present in the bazaars the full fly-proofing of cookhouses, dining rooms and food stores appears to be the most important.

Fly-proofing by means of wire-gauze made of No. 22 I. W. S. G. wire with 9 meshes to the linear inch has been made the standard type.

Kitchen's Window Fly Trap.—A description of this extracted from the "Military Surgeon" was circulated to all stations with a request for trial.

This consists of a trap composed of a frame holding two sheets of wire gauze in each of which grooved depressions allow access by means of small

holes to the space between them. The frame is fitted in place of a window in the cookhouse or dining room.

Reports on this have now been received and vary from "most useful" and "excellent traps" to "poor", "ineffective" and "useless".

As a whole they appear to be definitely of use provided they are properly made, provided no adventitious methods of escape are allowed to the captured flies and provided the trap does not appear definitely darker from the inside of the room than do the other fly proofed windows.

(*v*) *Composting.*—The Indore process although very sound in theory has not taken on readily in many places, in some it is most successful.

At Secunderabad the method was given an extensive trial over 2 years after an outlay of Rs. 17,000 on ground and prepared platforms etc. This was given up for the following reasons :—

1. Difficulty in selling the final product.
2. Difficulty in controlling the process in very wet or very dry weather.
3. Inability to prevent fly-breeding.

At Fort Sandeman dry refuse is disposed of in the military area by burning but the civil authorities have installed the composting method as the method of disposal for all refuse and filth.

This is in charge of a trained supervisor who has six coolies to help him and the whole plant is well run and free from offence. The compost is sold as manure and practically pays for the upkeep of the system.

Conclusion.—The secret of success appears to lie in having a thoroughly trained supervisor and suitable terrain for the sale of the final product.

(*vi*) *Bore Hole latrines.*—These have been taken into use in some places with success. They offer a most valuable method of safe excretal disposal. Evidence is accruing that pollution of subsoil water in normal soils is very limited from this type of disposal. Two points appear to be essential for success :—

1. The bore should reach subsoil water or nearly so.
2. Proper surface fittings should be provided.

This type of latrine was found to be filled up rapidly with stones in Jullundur Cantonment but was most successfully employed by an Indian Battalion in the same place having been constructed by the unit themselves.

J. *Water Supplies*

(*i*) A great improvement has taken place in the past 25 years and good controlled pipe supplies are now available in the majority of stations. But even now stations of Brigade size may be without a deep, safe supply. For example, Jhelum with a shallow well supply the project of a piped supply still remains at the top of the list of works, requiring Rs. 80,000 to provide a safe supply. Abbottabad has had a measure of success in that safe chemical treatment is now provided and a filtration plant may not be required.

At Lahore a review of the whole pipe distribution system has been made since 1938. It was found that whereas the cast iron pipes were sound the galvanised pipes were badly corroded owing to saltpetre in the ground. Rs. 10,000 has been spent on renewing parts of the system and another Rs. 20,000 will be required to complete the work. The pipes are now being laid wrapped in hessian coverings, soaked in Toron-antisaltpetre emulsion

At Wana an excellent new tube well gives a full supply which together with the original fort-well and irrigation water is turning Wana into a garden city.

At Bannu chloronomes have at last been provided for the two wells which were previously hand treated. To the writer's certain knowledge recommendations for the chloronomes have been made since 1929.

At Nasirabad on the edge of the "Drought" area the water supply has been so much reduced that drastic restrictions had to be imposed and finally has necessitated the removal of all troops.

New water supplies from deep tube wells have been provided in a number of places: Razmak, Lucknow and Agra. At the last a scheme of 5 new wells with high level tanks will give an ample supply.

The standard of No-lactose-fractors-in-100 cc. is aimed at and laboratory reports indicate that this high standard is usually achieved in all our larger supplies. In several stations where municipal or other civil supplies are utilised in cantonments it has been found necessary to rechlorinate the supply to obtain results which satisfy our standards. For example at Secunderabad an additional chlorination plant was required at the Gun Rock distributing reservoir to give satisfactory results from the Hyderabad Chlorinated Supply. Similarly at Allahabad rechlorination was necessary. This may of course be due to the condition of the pipe system as in the case of Lahore (above).

At both Bareilly and Roorkee, an investigation was carried out with regard to the presence of lactose fermenting organisms in the water supply. In both cases, the infection was considered to be taking place in the storage tanks, and steps are being taken to dust proof the tanks. In no instance were the lactose fermenting organisms adjudged to be typical coli, or faecal organisms. A special report has been rendered on the supply at Bareilly.

At Meerut one well produced suspicious water during the rains. This is being investigated by the R. E. with a view to increasing the protection of the well, and it is to be watched carefully this year. Fortunately the well can be cut out of use quite readily.

(*ii*) *Fluorine content.*—In Lahore District the fluorine content of new water supplies from tube wells were investigated.

In addition to the usual bacteriological examinations, each new tube-well has been tested for its fluorine content by the courtesy of the Director of Public Health, Punjab, and of B. L. Khuller, Esq., M.Sc., A.I.C., Public Health Department, Chemist.

Water from tube-wells in Lahore and Ferozepore give a fluorine content of from 0·15 to 0·4 parts per million. The Director of Public Health considers that it is too early to give standards for Indian waters, but Petrie and Churchill have stated that the water supply in all the affected areas in the U. S. A. contained over 2 parts per million.

Pillai writing from the Indian Institute of Science, Bangalore, states that a small community of individuals suffering from fluorosis were consuming water containing 4 to 5 parts per million of fluorine.

The fluorine contents of the Punjab waters relative to the occurrence of the clinical condition are being worked out.

(*iii*) *Poisoning of water supplies by tribesmen.*—It was formerly held that the tribesmen never interfered with water supplies. This comfortable belief

was dispelled in 1937 when they cut the aqueduct which carried water into Razmak and even more rudely shattered when in 1938 they poisoned the water in Asad Khel reservoir with picric acid.

Once again in 1939 they interfered with our water supplies by unsuccessfully attempting to poison with picric acid the drinking water reservoir at Dizh Narai.

All water since May 1938 has been tested daily for poisons at Razani, Damdil and Thal, and occasionally at Mir Ali, a special attention being paid to tests for arsenic. By means of surprise tests it is ensured that all medical officers, assistant surgeons and sub-assistant surgeons in Waziristan are thoroughly familiar with the use of the " Case, water testing, poisons ".

K. *Sandfly fever enquiry.*

The field and part of the laboratory work of this enquiry was carried out by an officer of the R. A. M. C. with a small staff at Peshawar under the direction and pay of the Director, King Institute, Guindy, Madras.

Field Work.

Systematic trapping of sandflies showed that P. minutus and P. papatassi were not present either at the beginning of the season or in the autumn below maximum temperatures of about 75—80° F. and minimum of 45° F. with a relative humidity of 40—45 per cent.

It was noted that as temperatures rise or fall so the period required for complete metamorphosis shortens or lengthens ; this is in July—August egg 4—6 days, larva 14—17 days, pupa 5—10 days, and average total 26—30 days : in September—October egg 6 days, larva 17 days, pupa 19 days ; average total 42 days ; the variation being chiefly in the pupal stage.

The application of coal-tar to the footings of all buildings for a distance of 2 feet upwards and outward from the junction of walls with ground was tried out. Surveys over a period of 10 weeks showed no appreciable reduction in sandfly population of the buildings until the coal-tar applications were extended to the interior wall-floor junctions when a reduction of 25 per cent to 50 per cent in sandflies was produced.

Investigations of insecticidal spray solutions on sandflies was carried out. Of the " kerosine base " solutions " Lethane " and three pyrethrum extracts, *viz.*, " Stafford Allen's Liquid Extract (Pyefly) ", " Pyrocide 20 " and " Pyracetone " were successful. " Lethane " appeared to be the most economical and the dosage required appeared to be constant, thus : in a closed room sprayed either with an atomiser or hand spray an atmospheric concentration equivalent to 7·0 cc. of pure solution per 1,000 c.ft. of air will kill all sandflies present, and concentrations as low as 0·8 or 1·0 cc. per 1,000 c.ft. will reduce sandflies present by 50—60 per cent. Pyrethrum extracts are costly, the dosage appears to vary at different dilutions and there is little residuary repellant effect so that evening spraying gives the most satisfactory results.

All these solutions can be used with success in much weaker strengths than the official dilutions. For example " Lethane " effective at 1 in 66 instead of 1 in 33 and Pyefly at 1 in 100 instead of 1 in 64.

NOTE.—Since these trials were carried out we have completed arrangements for the manufacture of pyrethrum extract sprays at the Medical Store Depots of Madras and Bombay. This spray solution is now in use and is most effective at a much less cost than proprietary solutions.

Two water-base insecticides, "Deskito" and "Multicide", were tested; but using a 7 per cent solution a concentration equivalent of 20 cc. pure solution per 1,000 c.ft. is required for killing.

The Phantomyst sprayer does not appear to have any real advantage over hand sprays.

An effort has been made to determine the maximum altitude at which P. papatassi is found. The flies exist in large numbers at Landi Kotal, at 3,500 feet, where the disease is met with in epidemic form during the hot weather period. At Cherat (4,500 feet) at a distance of 40 miles, and Abbottabad (4,000 feet) distance 110 miles, the fever is reported as occurring in sporadic form, suggesting that the cases are either imported from the plains, or else incorrectly diagnosed. In each of these places, a trained collector worked for two weeks, and the collection of flies brought down were despatched to Guindy for identification. No P. papatassi were among the specimens found at Cherat and at Abbottabad only two were noted in the collection examined.

Examination of earth samples for sandfly's larvae has been carried out by means of a special apparatus, in which the soil is broken up in a concentrated solution of magnesium sulphate and the supernatant material floated off to a settling tank and thence to a filter paper on a Buchner funnel. Of fifteen specimens examined, two have been positive, both of which were taken from shady places and contained a fair amount of moisture.

Laboratory Work.

Sera have been collected, during the first three days of fever, from seventy-eight cases of suspected sandfly fever. After dessication by a process of freezing *in vacuo*, over sulphuric acid, these sera were despatched to the King Institute for further examination. In Peshawar, seventy of these sera have been tested for the presence of virus by chorioallantoic membrane inoculation, with results as follows :—

Present 40, absent 16, presence uncertain 14.

An experiment was performed to investigate the effect of the dessicating process on bacteria contaminating serum. Suspensions of four organisms, which may be considered as possible laboratory contaminants, were kept in a frozen state (at 18° C.) *in vacuo* over sulphuric acid for a period of 12 hours, and then transferred to a dessicator, where they remained *in vacuo* over the acid for a further three days. Three of the organisms, *i.e.*, strains of B. coli, Flexner's dysentery bacillus (A-1) and Staphylococcus albus were still viable at the end of the process, and only one (Streptococcus viridans) failed to survive.

Fifty-one specimens of serum have been collected from sandfly fever convalescent patients, at intervals of 40 to 180 days from the date of the onset of the fever, and are being despatched in an undried state to the King Institute for the investigation of neutralising antibodies. In an attempt to minimise the effects of external temperature on the five day journeys from Peshawar to Guindy, these sera are being packed in vacuum flasks.

The serial passages of the virus on egg membrane and in flask culture have been maintained. In the former the virus is at its 73rd passage and in the latter at its 67th passage.

The sera received from Peshawar were tested for the presence of virus in the Institute at Guindy. In the majority of sera tested at Guindy, the presence of virus could not be demonstrated. It appears the sera were subjected to abnormal temperatures during transit, which factor among others probably accounted for this failure.

Serum and C. S. F. from a case of sandfly fever collected on the 1st and 2nd day of the disease respectively were tested for the presence of virus. It was found to be present in both as judged by lesions obtained on egg membranes.

65. PATHOLOGY.

The routine work again showed an annual increase during 1939. A total of 2,36,528 specimens were sent for laboratory examination during the year, 14,744 more than last year. This anuual increase which has now taken place for some years past is considered to be due to the following three main factors :—

(*a*) A greater appreciation by medical officers of the value of laboratory reports as an aid to clinical diagnosis, with the result that more specimens are sent from the wards to the laboratory for examination.

(*b*) A greater realization by all of the importance of the control of water and milk purification by laboratory tests.

(*c*) A greater ability, as the result of steadily improving equipment on the part of laboratories to undertake the more complicated investigations.

A larger number of examinations was also carried out in clinical side rooms of hospitals in connection with malaria, dysentery cases and chemical examinations of urine, etc. In the reports for the past two years it was pointed out that a considerable number of examinations at present carried out in laboratories could be done equally well in clinical side rooms if their equipment was slightly increased. Owing to the present war however this matter has been temporarily dropped.

Enteric Group of Fevers and Salmonella infections.—Repeated Widal tests were carried out on " bacteriologically undiagnosed " so called enteric group cases. A total of 42 cases were diagnosed " group " infection throughout the year which represented 19 British and 23 Indian. Of these, 18 were serologically negative and were diagnosed on clinical grounds only. The great majority of cases as noted last year were mild in type with few symptoms other than pyrexia and a slow pulse. The average pyrexial period for the above cases was 15 days. In last year's report it was pointed out that the diagnosis of enteric group in the absence of definite serological findings was too readily made. The same remark applies to the year under review and clinicians still seem to shrink from the term P. U. O., and are apparently most anxious to avoid the stigma which is fancied by some to adhere to this conclusion which is scientific provided the case has been thoroughly investigated and all bacteriological evidence etc., is negative. In this case P. U. O. or pyrexia of unknown origin is a perfectly sound diagnosis. In this connection it is pointed out however that the results of Widal tests carried out on these cases is not one hundred per cent efficient, and in some cases results obtained in inoculated individuals are of small value.

In carrying out the above tests TO and AO suspensions supplied by the Enteric Laboratory, Kasauli, were universally employed by Military Laboratories.

The serological findings in the following 8 bacteriologically proved cases show the uncertainty of the Widal reaction against O antigen in inoculated persons :—

TABLE 96

Diagnosis.	Widal Tests.											
	1		2		3		4		5		6	
	TO	AO	TO	AO	TO	AO	TO	AO	TO	AO	TO	AO
Typhoid fever .	0	120	0	0	0	0	...	...	...	...	...	...
Typhoid . .	20	0	80	0	20	0	0	0	20	0	80	20
Typhoid .	80	0	80	0	40	20	40	40	...	...	...	...
Typhoid . .	0	0	0	0	40	20	40	20	...	...	...	...
Typhoid . .	0	0	0	0	0	0	20	0	40	0	...	...
Paratyphoid A	40	80	40	20	80	0	80	20	...	...	...	...
Paratyphoid A	30	30	15	30	15	30	...	...	...	...	...	...
Paratyphoid A	0	0	30	60	20	0	...	...	...	...	...	...

A steadily rising titre to TO and AO antigen is very definitely suggestive of an infection by an organism of the enteric group, but a negative or low titre even repeated on several occasions is no proof that the disease is not enteric. It may also be added that one or more high titres, unless part of a steadily rising curve, are no evidence, for or against a fever of the enteric group.

An investigation concerning the production of Vi antibodies in the blood during an attack of typhoid fever and during the carrier stage was again undertaken by all military laboratories in India. Suspensions of Vi strains were as last year prepared and issued by the Officer-in-Charge of the Enteric Laboratory, Kasauli. In order to arrive at some definite conclusions a questionnaire was prepared and issued to all Laboratores. Replies were correlated by the Officer-in-Charge of the Enteric Laboratory, Kasauli, and are given below. The investigation is still in progress and all opinions about to be expressed are only tentative as the number of examinations completed is insufficient on which to form a definite opinion.

(*i*) Are Vi antibodies present in the serum of inoculated and uninoculated individuals in health ?

This investigation was only taken up by a few laboratories. The results obtained are shown in Tables 97 and 98.

TABLE 97

Vi antibody content in healthy uninoculated personnel

No. of cases examined.	Vi titre				
	0 to 1/10	1/20	1/40	1/80	1/160
	Per cent	Per cent	Per cent	Per cent	Per cent
275 . . .	80	9	8	2	1

TABLE 98

Vi antibody content in healthy inoculated personnel

No. of cases examined.	Vi titre				
	0 to 1/10	1/20	1/40	1/80	1/160
	Per cent	Per cent	Per cent	Per cent	Per cent
79	89·2	7·2	3·6	..	..

From the above tables it will be seen that both in inoculated and uninoculated personnel, the Vi content of the serum is extremely low—below 1/20 in 80 per cent in the case of uninoculated individuals : and also below 1/20 in 89 per cent in the case of inoculated individuals. As the uninoculated individuals were menials or Indian recruits, a possible explanation for the higher VI content in this class might be a previous attack of typhoid fever resulting in residual agglutinins.

This investigation is being continued during the current year and laboratories have been requested to start the dilutions at 1 in 5 in all future tests.

(*ii*) Are Vi antibodies invariably demonstrable in diagnosed cases of typhoid fever ?

The results of Vi agglutination tests in bacteriologically proved cases of typhoid fever are shown in Table 99 below .

TABLE 99

No. of cases examined.	Vi titre							
	Nil.	1/10	1/20	1/40	1/80	1/160	1/320	1/640
	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
46	17	..	..	13	13	25	25	7

From the above table it will be seen that in cases of typhoid fever, 83 per cent of the cases show a Vi titre of 1 in 40 : while 70 per cent show a titre of 1 in 80 or over. The significance of these figures is apparent on referring to Tables 97 and 98, which show that in health, the Vi titre in 90 to 95 per cent of individuals is 1 in 20 or less.

(*iii*) From a scrutiny of completed tests what is the characteristic of the Vi agglutination curve ?

Judging from a scrutiny of the completed tests carried out in proved cases of typhoid fever, there does not appear to be any one well defined type of curve such as used to be found with " H " agglutination tests in uninoculated individuals. The initial rise may occur within the first week, or be delayed until the third week or even longer.

Consecutive tests showed at first a rising titre, either rapid or gradual, until the peak was reached, when the curve declined as the temperature fell. A saddle back type of curve was occasionally noticed, showing a double rise. This may possibly have been due to a relapse.

There is, however, one feature of the Vi curve in typhoid which seemed to distinguish it from the non-specific Vi curves not infrequently encountered in other diseases. The true Vi curve usually showed a definite rise and fall, though the peak may not have been very high : whereas the non-specific curve may be high to start with, but in subsequent tests showed a gradual or rapid fall—there was no ascending to a peak. This characteristic was particularly noticeable in cases of typhus, where a relatively high Vi titre was frequently noted in the initial stages of the fever.

Investigations on the above lines are being continued and it is again pointed out that any conclusions drawn from the above are only tentative.

Isolation of Enteric Group organisms from blood culture.—A total of 4,642 blood cultures were taken during the year from cases suspected to be suffering from enteric group infections. The following is a summary of successful isolations. B. Typhosum 79, B. paratyphosum A 34, B. paratyphosu M B 3, and B. paratyphosum C 1. The average day of isolation was the 6th day after the onset of the disease.

Of the total cultures 11 per cent were found to be contaminated which is a marked reduction from last year when the percentage was 16.

In last year's report it was explained that sodium taurocholate medium containing gentian violet in a dilution of 1—16,000 had been recommended for use by all laboratories as a means of reducing the number of contaminations. The results on the whole have been most satisfactory. In one laboratory percentage of contaminations was only 1·7 when gentian violet was employed, whereas in the case of parallel cultures taken without the addition of the dye, the percentage was 14·4. Another laboratory adopted the practice of testing blood cultures first, and then, if found to be contaminated sufficient Gentian Violet was added so as to obtain the necessary concentration of the dye. Employing this method B. typhosum was isolated five times from blood cultures found to have been contaminated by a staphylococcus. One laboratory which did not use gentian violet was rewarded with a contamination rate of 20 per cent which markedly increased the all-India percentage.

It has been pointed out to all officers commanding laboratories that media containing gentian violet is only suitable for use in cases of suspected enteric group infection, and that, as a routine, blood should also be inoculated into glucose broth or some similar medium.

The reduction of contaminations by 5 per cent during the year under review is mainly attributed to the use of this dye.

Isolation of Enteric Group organisms from faeces and urine.—The isolations of enteric group bacilli from faeces were 46 (B. typhosum 28, B. paratyphosum A 16, and B. paratyphosum B 2). This figure is smaller than last year when there was a total of 61 isolations and also a greater number of isolations from blood culture. It is still felt however that apart from any defective technique in the collection of specimens in hospitals for despatch to laboratories, it is difficult to isolate organisms from heavily inoculated individuals who may be suffering from the disease.

All British troops diagnosed Enteric Group of infection during the year were again automatically sent to the Enteric Fever Convalescent Depot, Kasauli, for examination and test for a carrier condition, as, during last year in no case was any pathological organism isolated from any of these convalescents.

In the case of Indian troops necessary examinations in order to exclude the carrier condition are undertaken by local military laboratories.

Organisms of the Enteric Group were isolated from the urine of patients on 26 occasions.

In last year's report several cases of Typhoid and Paratyphoid infection exhibited unusual features and were described, this year only two such cases arose. In one B. typhosum and B. Paratyphosum A were isolated from the blood culture, and in another B. typhosum and B. dysenteriac Shiga were isolated from the faeces.

Organisms sent to the Enteric Laboratory, Kasauli, for confirmation or identification.—One hundred and seventy-four organisms were sent to the Enteric Laboratory during the year and were classified as follows :—

Bacterium typhosum	103
Bacterium paratyphosum A	39
Bacterium paratyphosum B	4
Bacterium enteritidis	3
Bacterium reading	1
Bacterium typhi-murium	1
Bacterium faecalis alkaligenes	5
Br. melitensis	1
Neisseria intracellularis	1
Coli and paracoli groups	16

The above is a considerable reduction, as compared with last year when a total of 246 cultures were received from outstations. The chief reductions are among the Enteric Group of organisms, and absence of organisms isolated from cases of cholera.

The preliminary identification tests on the whole were well carried out by military laboratories, although the percentage of paracolon organisms forwarded was fairly high. Many of them turned out to be late lactose fermentors; and the explanation appeared to be that the original identification was based on a rapid slide agglutination, together with a too short incubation period to permit of a correct determination of biochemical reactions.

Many organisms of the paracolon group produce a varying degree of granularity when tested by slide agglutination with a typhoid or paratyphoid serum of high titre, which, unless subsequently proved by Dreyer's technique, leads to an erroneous conclusion.

As regards the biochemical reaction, the Officer in charge Enteric Laboratory points out, that sugars made from varying brands of peptone take varying periods before developing the typical reactions of the organism under test. In his experience it was found that sugars made with nutrient broth gave quicker and more regular biochemical reactions than those made with peptone of poor quality. Apart from being more dependable the above procedure has the additional advantage of economy.

In addition to the causative organisms of enteric fever, five other organisms of the Salmonella group were isolated during the year. No atypical members were discovered.

Five organisms, classified as B. faecalis alkaligenes were received and confirmed by the Enteric Laboratory during the year. All the cases from which the organisms were isolated were widely scattered and apparently sporadic.

In one District four cases of infection with B. columbensis occurred. Three of the cases developed antibodies to a maximum titre between 100 and 250, and one to 500. One Indian other rank had a severe attack of the relapsing variety. The remaining three cases had urinary complications. Autogenous vaccines were employed in treatment in a strength of 250 million organisms per c.c. with beneficial results.

Dysentery.—Specimens from 4,171 cases of dysentery and 3,104 cases of diarrhœa were bacteriologically examined during the year 1939. A total of 16,062 bacteriological examinations were carried out in connection with these cases, a slightly lower figure than last year. There were 129 cases of amœbic dysentery and 15 cases of mixed bacillary and amœbic infection. Typical bacillary exudates were present microscopically in 58 per cent of the cases which curiously is exactly the same percentage as last year.

The percentage of isolation of organisms from cases with typical exudates varied in different laboratories from 95 per cent to 51 per cent. The results on the whole were most satisfactory and percentage of isolations was very much higher than last year. Table No. 100 shows percentage of isolations by commands.

TABLE 100

Comparative statement showing percentage of isolations of dysentery organisms by Commands—1939

Commands.	Typical Bacillary Exudate.					Indefinite Exudate.				Percentage of total cases from which dysentery organism were isolated.		
	Total cases.	No. of cases.	Percentage of total cases.	No. of cases from which organism isolated.	Percentage of Col. 5 with Col. 3.	No. of cases.	Percentage of total cases.	No. of cases from which organisms isolated.	Percentage of Col. 9 with Col. 7.	Typical Bacillary Exudate.	Indefinite Exudate.	Total.
1	2	3	4	5	6	7	8	9	10	11	12	13
Eastern Command .	1,275	683	53·56	595	87·11	592	46·43	235	39·69	46·66	18·50	65·16
Northern Command .	1,477	919	62·20	790	86·00	558	37·80	300	53·76	53·49	20·99	74·48
Southern Command .	1,076	716	66·54	549	76·68	360	33·45	162	45·00	51·02	15·06	66·08
Western (I.) District .	343	179	52·19	156	87·15	164	47·81	58	35·37	45·48	16·91	62·39

The increased percentage of isolations of dysentery organisms is, it is felt largely due to the employment of buffered glycerine and saline solution when taking specimens for examination. This method was described by Major A, Sacks, R.A.M.C., in the Journal of the Royal Army Medical Corps, October, 1939.

It consists of 30 per cent glycerine in normal saline, adjusted with sodium phosphate to a reaction of pH8, and tinted with phenol-red. This mixture is put up in 10 c.c. quantities in small screw-capped bottles, and should only be used if it is of a pink colour. The development of acid, which is liable to occur in glycerine, and is fatal to the dysentery bacillus, is shown by a change in colour from pink to yellow.

Northern Command who head the list of successful isolations issued instructions that this method was to be employed by all laboratories in the Command. Each hospital was initially supplied from the nearest military laboratory with a sufficient number of bottles containing the buffered glycerine and saline solution ; and as each bottle containing a specimen of stool was received at the laboratory a fresh bottle containing sterile solution was sent back to the hospital. In this way it was ensured that hospitals always had available a suitable stock of filled bottles, while the cleaning, sterilizing and refilling were carried out in the laboratory.

The above scheme achieves two aims :—

(*a*) The laboratory does not have to deal with foul smelling bed pans.

(*b*) It is easy for medical personnel in the wards of hospitals to pick out a piece of mucus and place it in the bottle of glycerine and saline immediately a stool is passed at any hour of the day or night. All concerned can then await their convenience in sending the specimen to the laboratory.

It has been recommended that the above procedure be adopted in other Commands and it will be interesting to see if in the future the percentage of isolations increases to the same extent as has occurred in Northern Command.

As in previous years isolations from out-stations were poorer than those in which a laboratory is located, the adoption of the above method of despatch of specimens to laboratories may in the future produce better results.

Type of Dysentery organisms isolated.—A total of 1,395 Andrew's types of B. flexner were isolated during the year, this is an increase of 141 when compared with 1938. The Boyd strains also showed an increase in number of isolations and totalled 468. Type D. 19 this year was far less common than others and was only isolated on one occasion by a Laboratory in Southern Command.

Work has continued in the Enteric Laboratory, Kasauli, on the preparation of mono-valent type specific sera for the accurate typing of dysentery organisms. The use of such serum has again this year been restricted to the Enteric Laboratory. During the year all unidentified organisms having the morphology and biochemical reactions of the flexner group of dysentery bacilli were forwarded to Kasauli for investigation. Of those forwarded a total of 19 were eventually identified and 8 were considered not to be true dysentery organisms. Four cultures of B. dysenteriae Newcastle were forwarded from Quetta. All four cases occurred within a very short period of each other.

The Officer in charge, the Enteric Laboratory, makes the following remarks concerning the organisms sent to him for identification :—

" While mannite constitutes the fundamental test for distinguishing the flexner-sonne group from the Shiga-Schmitz group, it occasionally happens that certain strains, particularly on primary isolation ; fail to ferment mannite, yet are antigenically identical to one or other of the flexner group.

This failure to ferment mannite is not however permanent, and usually disappears on repeated subculture. It can be readily understood that many of the organisms that have been classified in the past as in-agglutinable members of the Shiga-Schmitz group really were of this type.

As regards the organisms not considered to be true dysentery, the majority proved to be late lactose fermenters of the paracolon group ; and their inclusion was due in part to insufficiently long incubation, and in part, possibly, to the sugar media having been prepared from a low grade peptone.

The distribution of the various strains of dysentery bacilli throughout the four Commands during 1939 is shown by laboratories in Table No. 101 and the percentage of each group in each Command in Table No. 102.

TABLE 101

Analysis of types of dysentery bacilli isolated during 1939, and positive results for E. histolytica

Commands and Laboratories.	Group A-1 B-Flexner Andrew's strains V. W. X. Y. Z.	Group A-2 Boyd's strains 103, 170 and 110.	Group B Boyd's strains 88, 288, D. 1, 274.	Group C B-Sonne.	B-Shiga.	B-Schmitz.	Entamoeba histolytica.	Total.
Northern.								
Kasauli	5	5	8	25	1	...	...	44
Peshawar	147	10	13	37	43	18	1	269
Kohat	37	8	6	11	7	15	4	88
Razmak	185	4	4	2	21	14	6	236
Rawalpindi	86	20	22	32	37	6	...	203
Lahore	43	...	1	14	10	5	10	83
Bannu	64	...	13	...	10	5	4	96
Sialkot	12	1	3	...	4	3	1	24
Ambala	15	...	...	12	7	1	7	42
Abbottabad	10	4	3	2	4	1	...	24
Total	604	52	73	135	144	68	33	1109
Southern.								
Poona	105	14	33	63	31	26	8	280
Colaba	24	3	...	1	8	...	...	36
Bangalore	34	2	...	34	13	7	4	94
Trimulgherry	48	14	25	13	15	10	7	132
Jubbulpore	58	5	18	14	5	5	1	106
Mhow	30	8	16	2	2	1	5	64
Nasirabad	20	1	...	7	8	4	4	44
Total	319	47	92	134	82	53	29	756
Western (I.) District.								
Quetta	40	28	33	41	6	11	2	161
Karachi	30	2	2	10	3	1	...	48
Total	70	30	35	51	9	12	2	209
Eastern.								
Meerut	52	27	26	28	10	6	3	152
Lucknow	82	11	13	38	10	4	18	176
Calcutta	64	4	4	26	7	9	9	123
Bareilly	17	12	11	9	13	2	11	75
Dehra Dun	27	1	2	3	4	2	16	55
Jhansi	127	11	17	45	10	25	6	241
Allahabad	33	...	...	5	9	...	2	49
Total	402	66	73	154	63	48	65	871
Total all India—								
1939	1395	195	273	474	298	181	129	2945
1938	1254	193	257	457	236	169	223	2789

TABLE 102

Percentage of types of dysentery bacilli isolated in the Commands during 1939 and percentage of positive results to E. histolytica

Command.	Total.	Group A-I B-Flexner strains Andrews V. W. X. Y. Z.	Group A. Boyds strains 103, 170 and 119.	Group B Boyds strains 88, 288, D. 1, 274.	Group C B-Sonne.	B-Shiga.	B-Schmitz.	Entamoeba histolytica. Positive cysts.
Northern	1,109	54·5	4·7	6·6	12·2	12·9	6·1	2·9
Southern	756	42·2	6·2	12·2	17·7	10·8	7·0	3·8
Western (I.) District	209	33·4	14·4	16·7	24·4	4·3	5·7	0·9
Eastern	871	46·2	7·6	8·4	17·7	7·2	5·5	7·5
Average all India	...	47·3	6·6	9·2	16·1	10·1	6·1	4·3

In Table No. 102 it will be seen that there is really little difference between Commands in the percentages of the various infections to the total in the Command. Western (I.) District, however, had for the third year in succession the highest percentage of B. sonne infection. These figures represent careful work in 26 laboratories situated in different parts of India. No figures are as yet available from civil sources but it is considered that they represent accurately the various types of dysentery among the civil population.

Routine examination of menials prior to employment.—A total of 14,366 menials were examined during the year prior to employment. This represents a total of 44,247 actual examinations, an increase of over 5,000 compared with last year. As a result of these examinations organisms of the dysentery group were isolated on 26 occasions which is a slight decrease from last year; organisms of the Enteric group were isolated on 4 occasions only.

Microscopical examinations for the presence of Entamoeba histolytica cysts are not carried out as a routine measure, but in many laboratories are voluntarily undertaken for instructional purposes. Thirty-one thousand examinations of this nature were carried out and cysts demonstrated on 60 occasions only.

All the above stools were also examined for helminth infection. The following table illustrates the findings in each Command.

TABLE 103

Commands.	Taeniidae.	H. Nana.	Ascaris lumbricoides.	Ankylostoma type.	Trichuris trichiura.	Enterobius vermicularis.	Strongyloides stercoralis.
Southern	6	33	165	290	65	15	...
Eastern	12	39	180	280	63	12	47
Northern	15	43	67	636	51	10	...
Western (I.) District	...	...	6	16	3	1	...

Testing for the presence of Vi antigen in the serum was undertaken by certain laboratories in order to help in the detection of carriers of B. typhosum but the results obtained were disappointing. In one laboratory a total of 117 individuals was examined but only in twelve cases were Vi antibodies present to any degree; *viz.*, a titre of 1—20, eight cases, 1—40, two cases and 1—160 two cases. Particular attention was given to the examination of the stools of these individuals but in no case was any pathogenic organism isolated.

Another laboratory carried out similar tests on 80 newly employed menials but in this case also results were negative.

Diphtheria.—Throat swabs from 3,332 individuals suspected of suffering from diphtheria were examined during the year of which 177 were positive for C. diphtheriae. In all 4,634 bacteriological examinations were made 394 being found positive.

The positive cases occurred in Commands as follows : Northern Command (35), Eastern Command (61), Southern Command (80), and Western (I.) District (1).

Nasal swabs from 192 suspicious cases were bacteriologically examined with positive findings on 24 occasions. Again this year all virulence tests were carried out by injection and post mortem examination of guinea pigs in addition to the intra-dermal test.

During the year small outbreaks of diphtheria occurred in Bangalore, Madras and Wellington, in all 30 cases were diagnosed which included 10 children. During investigations undertaken as the result of these cases a total of seven carriers was detected. Sixty-seven children were immunized with T. A. F. and after immunization no further cases occurred. It was not possible to Schick test the children either before or after immunization but the cessation of cases leads one to believe that the procedure was successful.

Small outbreaks also occurred at Subathu and Sialkot but in each case subsided as soon as the responsible carriers were found and treated.

One Laboratory investigated thirty-three cases of chronic ulcers from which men of a British Regiment were suffering after serving in Waziristan, in three cases virulent C. diphtheriae were isolated from the ulcers.

In the Southern Command Laboratory, Poona, the swab method for the detection of K. L. B. as described by Manzillo in the British Medical Journal was given an extensive trial.

The results obtained were in accordance with other wokers ; *viz.*, in some positive cases a quick diagnosis was possible but false positives were frequently obtained, on the other hand a negative finding afforded presumptive evidence against diphtheria.

Cerebrospinal Fever.—A total of 37 individuals were diagnosed cerebrospinal meningitis during 1939, positive cultures of meningococci were obtained from 22. The majority of the remaining cases were diagnosed as the result of examination of deposits in out-stations where laboratory facilities for bacteriological examination did not exist. Of the 22 positive cultures 5 belonged to Group I and 13 to Group II, four were not classified.

A total of 284 cultures from cerebrospinal fluid of cases of varying nature, including the above, were made during the year, the great majority of which were from laboratories situated in Northern Command (129). It is interesting to note that exactly the same number of examinations was carried out last year by the same laboratories. Cell counts totalled 397, microscopical examination of deposits 300, Lange's gold chloride test 98, chemical examinations *e.g.*, globulin chlorides, etc., 412. Two hundred and ninety Wassermann tests were carried out on cerebrospinal fluid in Poona, Rawalpindi, Quetta and Meerut.

Fevers of the Typhus Group.—A total of 90 cases were diagnosed typhus fever during the year, on serological grounds. The following table shows the type of infection and Commands in which the cases occurred.

TABLE 104

Command.	OX 19.	OX 2.	OXK.
Northern	14	3	20
Southern	20	9	10
Eastern	2	2	9
Western (I.) District	1	..	..
Total all India	37	14	39

It was noted that cases of infection with OX 19 and OX 2 occurred fairly regularly throughout all the months of the year, but 27 out of the 39 cases of OXK were infected during the months August, September and October. The greatest number of cases that occurred during any one month was at Dagshai where 8 infections with OXK were recorded in August.

Investigations have been carried out by various workers both civil and military in an attempt to discover the vector of these fevers. The louse, flea, tick and mite have in turn been under suspicion but so far no definite conclusion has been reached.

Brucella Group infections.—Seventeen cases were diagnosed on serological grounds throughout the year. In Razmak five cases occurred and as the suspected source of infection was goats milk obtained surreptitiously by the troops, a preliminary investigation was carried out by the D. A. D. P. with a view to determining if brucella infections were common among such animals in Waziristan.

Samples of blood from 75 female goats were tested for the presence or absence in the sera of agglutinins of the brucella group of organisms. The results are tabulated below :—

TABLE 105

Number examined.	Emulsions employed.	Titre obtained				
		0-25	25-50	50-100	100-250	250-500
75	B. abortus	64	3	3	1	4
	B. melitensis	64	..	..	..	..

From the above table it will be seen that female goats suffer from B. abortus infection to a definite extent, and the number that have been infected at one time or another is at least 10 per cent. The fact that no significant rise in the titre against B. melitensis was found in this investigation tends to confirm the view, which is usually held, that B. melitensis infection does not occur in Northern India. Although the drinking of unboiled milk in Waziristan is forbidden, it is thought that the cases of Brucella fever which occur each year among Indian troops may be due to drinking such milk derived from unauthorised sources.

Further investigations on the above lines are being carried out during 1940.

Laboratory tests in connection with the diagnosis of syphilis.—The number of Wassermann tests carried out in the four laboratories (Quetta, Poona, Rawalpindi and Meerut) engaged in this work numbered 18,668, and the number of Kahn tests 13,835. These figures in the case of the former are 1,491 more than last year, and in the case of the latter show an increase of 317.

The percentage of haemolysed or septic sera, and broken capsules received in the above laboratories was exactly the same as last year, only 1·5 per cent. which tends to show that great care must have been taken by hospitals in the taking and despatch of specimens for examination. The employment of the Kahn test as a check on the Wassermann test is considered by many to be most essential, especially from the point of view of technical errors which may be encountered in the actual performance of the tests. The check is also of value in the case of diseases which may give a false Wassermann reaction, and also in cases with no history of syphilis in which the diagnosis is " tonsillitis " or perhaps " dermatitis ". In such cases a doubting medical officer may not accept the result of a single test with the result that treatment is delayed ; but, if a positive Wassermann reaction is supported by a positive Kahn test treatment may be commenced immediately. In the case of syphilis a positive Wassermann reaction appears earlier than a positive Kahn, but on the other hand the latter persists longer, and so has a definite advantage as a control on the effects of treatment.

The District Laboratory, Quetta, has continued the practice of bleeding guinea pigs for complement only once a month. The Officer Commanding the laboratory reports that he has had no difficulty in keeping complement frozen for six weeks or even two months and then still obtaining a satisfactory titre of 1/50.

The work done in the four laboratories and results obtained are shown in Tables 106 and 107.

TABLE 106

Wassermann and Kahn tests—1939

Laboratory.	Total Wassermann tests carried out.		Total Wassermann tests carried out on blood sera from all sources.	Total Wassermann tests on C. S. F.	Total Kahn tests.	Percentage sera haemolysed and septic.		Percentage capsules broken.	
	British troops.	Indian troops.				Br.	Ind.	Br.	Ind.
Southern Command Laboratory, Poona.	2,293	2,967	5,082	98	5,246	4·36	3·47	0·74	0·30
District Laboratory, Rawalpindi.	1,707	4,150	6,047	104	2,541	0·46	1·00	0·75	0·23
District Laboratory, Meerut.	1,912	2,094	4,293	73	4,276	4·20	4·50	0·16	0·53
District Laboratory, Quetta.	844	936	2,022	49	1,772	0·94	1·35	0·35	1·25
Total .	6,756	10,147	18,344	324	13,835	...	...	...	...

TABLE 107

Results of Wassermann tests—1939

	Poona.		Rawalpindi.		Meerut.		Quetta.	
	Negative.	Positive.	Negative.	Positive.	Negative.	Positive.	Negative.	Positive.
Syphilis Primary (before treatment) .	36	297	13	52	16	152	...	3
Syphilis secondary .	...	60	...	7	...	43	...	14
Syphilis tertiary .	...	70	1	8	...	84	...	17
Syphilis (after treat .	*1,677	315	1,632	556	1,270	175	488	116
Gonorrhœa . . .	12	6	43	7	10	...	...	...

* In view of the transfer of units to other commands and overseas, these figures are not absolutely accurate furthermore, some of the cases are still undergoing treatment.

The number of cases diagnosed primary syphilis on a positive Wassermann reaction is still considered to be too high. In the case of Indian troops there is little doubt that many report late for examination having previously obtained local treatment in the bazaar.

In the case of hospitals situated in a station where no laboratory facilities exist the practice is still continued of forwarding specimens of sera (taken from the sore) in capillary tubes to the nearest laboratory for examination. Experience has shown that spirochaetes remain alive for many days under these conditions but medical officers seem to find it very difficult to send suitable specimens. In a large number of cases the specimens received consisted of blood only. In 50 cases however out of 300 forwarded for examination positive results were obtained and enabled these patients to be treated before their Wassermann reaction became positive.

The following tables show the method by which primary infections in the case of British and Indian troops were diagnosed throughout the year by Commands.

TABLE 108

British Troops

	Number of cases of syphilis fresh admitted to Hospital.	Number of cases of syphilis fresh diagnosed.		
		By demonstration of T. pallida.	On Positive Wassermann Reaction.	By demonstration of T. pallida and on positive Wassermann Reaction.
Northern Command	61	31	22	8
Eastern Command	92	40	46	5
Southern Command	118	49	55	14
Western (I.) District	16	12	2	2
Total all India	287	132	125	29

TABLE 109

Indian Troops

	Number of cases of syphilis fresh admitted to Hospital.	Number of cases of syphilis fresh diagnosed.		
		By demonstration of T. pallida.	On positive Wassermann Reaction.	By demonstration of T. pallida and on positive Wassermann Reaction.
Northern Command	122	30	83	9
Eastern Command	99	35	61	3
Southern Command	117	24	75	12
Western (I.) District	18	3	15	..
Total all India	356	92	234	24

In one District Laboratory at the request of the Specialist in Dermatology complement deviation tests for gonorrhæa were undertaken with the object of deciding when the correct moment had arrived for beginning treatment with Sulphanilamide. At first a considerable number of tests were carried out; but, with the introduction of M. & B. 693, the value of the test declined and *pari passu* the number of sera received in the laboratory decreased.

Malaria.—No cases of haemoglobinuria occurred amongst malaria patients treated with atebrin and plasmoquin. In the previous year six such cases occurred.

In one District, a fatal case, which presented the clinical picture of " black water fever " together with the signs and symptoms of cerebral malaria, was reported. Blood smears showed a very heavy infection with malarial parasites which were considered by the medical officer who examined the slides at the clinical side room to be the result of a mixed P. malariae and P. falciparum invasion. On the slide being submitted to the District Laboratory for confirmation, the D. A. D. P. considered that P. falciparum alone was present but in various stages of development, a diagnosis which was subsequently confirmed by the Director of the Malaria Institute of India. The mistake at the clinical side room had arisen through the medical officer mistaking the pre-crescent stage of P. falciparum for the " band " forms of P. malariae.

Another interesting fatal case was reported from a different District. A British soldier was admitted to hospital suffering from fever. Although repeatedly looked for, no malarial parasites were at first found. The patient subsequently developed jaundice, and finally P. falciparum parasites were discovered.

This case is in marked contrast to the other described, in which the peripheral blood was loaded with parasites. It is, however, well recognised that in some severe cases of subtertian malaria the parasites may be extremely scanty in the peripheral blood.

Anaemias.—Attention was drawn in the annual reports for 1937-1938 that a number of cases of hyper-chromic macrocytic anaemia had been detected in Waziristan District. The presenting picture of these anaemias consisted of debility, anorexia, flatulence, diarrhæa, sore tongue, loss of weight and anaemia. In all Districts in Northern Command accurate and complete blood pictures from oxalated samples of venous blood are now carried out as a routine in all cases of anaemia. The investigations include, among others, the determination of the size of the red cells, counting the reticulocytes and testing the Van den Bergh reaction.

Officers in charge of laboratories when reporting on these specimens express an opinion regarding the nature of anaemia present. The clinician is thus guided in the treatment and progress of his cases.

Notes on routine laboratory work.—Biochemical work showed a definite increase over 1938, *e.g.*, blood sugar estimations rose from 321 to 336, and blood urea from 278 to 345. The increase in the number of examinations of this kind is considered to be due to the fact that clinicians are becoming more alive to the great help that these tests afford them in the diagnosis of their cases, and there is also a great readiness apparent on the part of Officers in charge of laboratories to undertake them. Furthermore, with the steadily improving standard of equipment in military laboratories, there is a much greater capacity to complete the more complicated biochemical investigations.

Blood typing tests were carried out on 2,139 individuals which is an increase of 845 tests as compared with last year. All laboratories continue to prepare and store their own Group II and III sera in order to be in a position to carry out this important test. Blood sedimentation tests increased by 231 to 663. This test has become far more universal throughout laboratories but as last year the greatest number was carried out at the District Laboratory, Razmak. This laboratory was also responsible for 164 reticulocyte counts out of a total of 300.

Post mortem examinations were undertaken when considered necessary and numbered 91 of which 40 were performed in Eastern Command alone. In one case death was found to be due to meningitis caused by a typical B. influenzae, this organism was also recovered from pus in the right knee joint. All available literature has been studied but no record can be found of infection of a joint cavity by this organism.

Bacteriological examinations of water numbered 2,373 which is a slight decrease from last year. It was noted that lack of uniformity appeared to exist among laboratories in the methods of examining water bacteriologically, and in the expression of results, due probably to the various methods given in different text books. All laboratories have been circularised and recommended to employ the method laid down in the Ministry of Health Bulletin No. 71. Chemical examination of specimens of water are comparatively rarely asked for but numbered 197 as compared with 159 last year. Bacteriological examination of specimens of milk numbered 402 which corresponds closely with the total of last year's examinations.

There were 1,526 examinations for the presence of T. pallida in scrapings of which 207 gave positive results. The diagnosis of syphilis by means of the Wassermann reaction or by the demonstration of the presence of T. pallida has already been referred to.

A total of 9,431 specimens of urine were culturally examined which included 1,243 examinations carried out in the Enteric Laboratory, Kasauli in connection with the investigation of convalescent patients who had suffered from infection with the Enteric Group. From the total number of specimens examined in all laboratories B. coli was isolated on 339 occasions.

Scrapings from cases suspected of suffering from tropical sore numbered 523 as compared with 349 last year. Leishman-donovan bodies were demonstrated on 147 occasions, the District Laboratory, Quetta, being responsible for 90 positive tests. As far as Quetta is concerned this is a very definite increase from last year, the Officer in charge of the laboratory attributing it to the arrival in Quetta of new " unsalted " troops. He also remarks that it is interesting to note that since his arrival in Quetta in 1936 he has only seen one case of an oriental sore on the face of an adult European female. Boys and girls are equally infected on the face. It appears that the powder and cosmetics used by ladies have a repellent effect. Ladies are mostly affected round the arms and legs.

Further animal experiments on transmission of this condition were undertaken but results obtained were unsatisfactory and inconclusive.

The increase in the number of cases infected this year in Quetta is of interest as it coincided with a decrease in the number of cases of sandfly fever although sandflies were unusually prevalent.

The quantities of serum and agglutinable suspensions issued to Laboratories by the Enteric Laboratory, Kasauli, were as follows :—

	c.cs.
(*a*) Military Laboratories :	
Agglutinating sera	5,344
Standardized agglutinable suspensions	4,450
Concentrated agglutinable suspensions	13,160
(*b*) Civil Institutions :	
Agglutinating sera	210
Standard agglutinable suspensions	37,050
Concentrated agglutinable suspensions	1,800

From the above it will be seen that whereas the majority of the suspensions supplied to military laboratories are in the concentrated form, those supplied to the civil institutions are chiefly in the form of standard agglutinable suspensions. The reason for this is that military laboratories deal with a population fully protected against the Enteric Group of diseases, and consequently diagnostic agglutination tests are carried out with the O antigen only, using Felix's technique, whereas civil institutions deal with an almost entirely unprotected community, in whom the H antigen—antibody reaction, carried out by Dreyer's technique, is not obscured by previous inoculation, and gives reliable results.

It is greatly appreciated that the civil authorities, both institutions and private practitioners obtain such large quantities of these diagnostic materials from our Military Laboratory in Kasauli.

Tissues sectioned and reported on totalled 564 which included a large number of reports on tumours. In addition a total of 118 sections were made from the brains of dogs, jackals, cats, horses and bulls suspected of having suffered from rabies. Negri bodies were demonstrated on 51 occasions.

As stated in last year's report the amount of section work undertaken, apart from the size of the station obviously depended on the interest taken by the Officer in charge of the laboratory and many of the above examinations were undoubtedly carried out for instructional purposes only. The largest number of examinations of this nature were carried out in Meerut and Quetta.

The number of autogenous vaccines prepared again slightly decreased this year but numbered 409. During the year 8 medical officers, 9 assistant surgeons, and 5 sub-assistant surgeons were trained in laboratory duties and in addition 13 assistant surgeons and 25 sub-assistant surgeons were trained in clinical side room work. Training of this nature is essential in order to have a reserve of trained personnel for laboratory duties and also to ensure that as many as possible are competent to undertake the duties relevant to a clinical side room.

Many laboratories throughout the year purchased new up to date equipment and all are now well equipped. Officers in charge are encouraged to add to their equipment annually, within reason, and as far as funds will permit.

Enlarged Clinical Side Rooms.—Enlarged clinical side rooms established at Jhelum and Wellington have again this year thoroughly justified their existence. In Jhelum over 4,000 various tests were carried out during the year. The isolation of dysentery organisms from stools was most satisfactory, in the case of those with a typical bacillary exudate organisms were isolated in every case, and in those with an indefinite exudate in 50 per cent. of cases. One case of enteric group fever occurred in the station during the year and B. Paratyphosum A was isolated from the stools.

In the case of Wellington a total of 1,075 examinations was carried out which included all routine examinations normally entrusted to District or Brigade laboratories. In the case of dysentery specimens showing a typical bacillary exudate causative organisms were isolated in 81 per cent. of cases, and in those with an indefinite exudate in 50 per cent.

In the past it has been the custom for all results obtained by these enlarged clinical side rooms to be checked by the parent laboratory but in all cases results were found to be so satisfactory that this practice has been discontinued.

In December 1939 another enlarged clinical side room was opened at Wana and it is anticipated that it will prove itself to be as useful and efficient as those already established.

Library.—The Medical Directorate's Technical Library has again been extensively used by many medical officers throughout India, a total of 165 reference books having been issued on loan and 40 new volumes purchased.

Medical Co-operation.—It is again very satisfactory to note this year that practically all officers commanding hospitals have made special reference in their annual medical transactions concerning the close liaison between the pathologist and the medical officers in charge of cases. It is undoubtedly due to this liaison that the results throughout the year have again been so satisfactory.

66. Medicine.

(*i*) *Malaria* being one of the commonest conditions receives considerable attention from the therapeutic side. The standard course of treatment, which is recommended but not compulsory, is :—

British troops—		
Atebrin	. .	0·3 grammes daily for 7 days. Interval of three days.
Plasmoquine	.	0·03 grammes daily for 5 days.
Indian troops—		
Atebrin	. .	0·3 grammes daily for 7 days. Interval of three days.
Plasmoquine	.	0·02 grammes daily for 5 days.

In quite a number of stations medical officers prefer to use an initial treatment of Quinine grs. X T. D. S. until the case is afebrile or for two days prior to the exhibition of Atebrin.

In some cases Atebrin musonate has been used for a similar purpose. In the majority an iron and arsenic tonic is added for convalescence.

One case of temporary acute mania after Atebrin is recorded for a Sepoy in Southern Command.

Results from this treatment appear to be definitely satisfactory as indicated by the reduction of malaria in British troops and general fall in its incidence. One pessimistic medical specialist however considers the relapse rate is much higher than it is generally held to be. He estimates the figure at 31 per cent. for benign tertian and 19 per cent for malignant tertian cases in British troops.

Several observers have commented to the effect that " It is remarkable that the same individuals come into hospital with malaria each succeeding season. It would appear that such cases never develop immunity".

Another explanation may of course be that these individuals are " infection-prone " from carelessness or deliberate disregard of precautions.

A drug called Tebetren has been tried for treatment, but preliminary reports do not indicate any remarkable success.

Malignant tertian malaria was considerably in evidence in certain areas and quartan cases were reported. Some of the malignant cases were definitely connected with infection at Kathgodam on the way to or from Ranikhet.

(*ii*) *Dysentery.*—Of Bacillary dysentery Flexner has of course formed the bulk, but Shiga and other groups were present to about 10—15 per cent. of cases.

Amoebic dysentery and amoebic hepatitis were particularly noted in Southern Command and from Lucknow District.

Routine sodium sulphate treatment with high protein diet has sufficed for the ordinary bacillary dysentery, though serum treatment was needed in the more severe cases (Shiga). Yatren was used by some both for bacillary and amoebic types. Bismuth Emetine Iodide was successfully used for the amoebic cases and hepatitis.

In one chronic case with four months history no organism could be isolated in hospital although the laboratory was next door and the patients serum agglutinated a Boyd organism to 1 in 125. After discharge from hospital an organism was isolated from a stool specimen sent in buffered glycerine from an out station.

(*iii*) *Sandfly fever.*—An epidemic was reported from Lucknow which produced 160 admissions for British Troops between May and October. The type was mild, fever 3—4 days with some saddle back temperatures. P. papatassii were prevalent throughout the season, but the type of fever changed to that of dengue later in the season, though there was no rash. At this time Aedes egypti were very prevalent for a while. Differential diagnosis is by no means easy.

In Quetta the average pyrexial period proved to be 2½ to 3 days and the average stay in hospital 8·2 days.

From the comments made on these cases of short fevers ; sandfly fever, dengue, sellar fever, influenza, it is obvious that our methods of diagnosis are far from accurate and much may depend on the whim of the individual.

(*iv*) *Jaundice* was noted from many places but all cases were considered to be jaundice of the simple catarrhal type often with a history of chill or exposure after considerable heating or of indiscretions of diet.

Digestive diseases and peptic ulcers were treated with many methods and particular comment is made on the difficulty of post hospital dieting for the unmarried soldier. In some cases ration money has been issued for the purchase of meals.

A case of complete atrophy of the whole of the intestinal mucosa from mouth to rectum in a child aged 18 months of undetermined cause is mentioned.

Typhoid fever cases from Bannu included one so typical that he formed a valuable lesson to orderlies under training.

(*v*) *Kala-azar* cases of long standing with severe anaemia were treated successfully at Lahore with Urea Stibamine after neostibosan had been used. The medical specialist concerned considers the former gives better and more lasting results than Neostibosan. But at Bangalore a case was successfully treated with Neostibosan.

(*vi*) *Cysticercosis* with convulsions was seen in a case in Lahore. He had been brought up in India, enlisted here and served here over 4 years. X-ray examination showed numbers of calcified cysts deep in the musculature of arms and legs.

(*vii*) *Glandular fever.*—A case was reported from Cherat with enlarged glands of neck, axillae and groins, and enlarged liver and spleen. Laboratory results were positive for Hetrophile antibodies. He recovered with symptomatic treatment.

(*viii*) *Anterior poliomyelitis* occurred in acute form a number of times. At Murree-Rawalpindi an improvised *iron lung* was made for one case which succeeded for 50 hours and brought another case from Peshawar to Rawalpindi.

Further models of *iron lung* have been made from Tar-barrels and now a good model has been designed at the Rawalpindi Arsenal for retention at main hospitals while a portable all wooden Breathing machine has been devised for transport of cases by plane or ambulance car.

(*ix*) *Oriental sore.*—8 cases were treated at Mir Ali with most gratifying results by means of copper sulphate and lactic acid solution. Treatment of cases by scraping and prontosil was not successful.

(*x*) *The Sulphapyridine-group of Drugs.*—Officers Commanding hospitals were again asked to include comments on these in their transactions. All hospitals where cases of pneumonia and gonorrhœa have been treated are unanimous in testifying to the efficiency of M. & B. 693 in the treatment of these conditions. For example in 11 cases of lobar pneumonia the average time for defervescence was 3 days followed by uninterrupted recovery. One case, which was unconscious, was given an injection of soluble M. & B. 693 and was able to take it orally immediately afterwards. The drug was not so successfully used in Broncho-pneumonia.

For gonorrhœa M. & B. 693 was extensively used, larvage being unnecessary. The average stay in hospital varies from 14 to 17 days and will probably be made shorter. From Dharamsala comment is made that there is always a decrease in total W. B. C. after treatment. No case was given M. & B. 693 in which the W. B. C. count was less than 6,000. Daily counts controlled the dosage which was stopped if the count fell below 5,000.

Every imaginable type of case has received treatment with this group of drugs and it is now time that a sane use of the drug for those cases in which it is known to be effective should be the order. In addition of course the question of adequacy of supplies of the drug during the war becomes of importance and reasonable economy is imperative.

One or two special cases are worth mention : a British officer desperately ill with pneumonia miraculously cured with M. & B. 693 ; an I. O. R. with meningitis (organism not isolated) ; cases of pneumonia, British and Indian, with cures almost phenomenal and cases of acute streptococcal infections.

A feature of the treatment is the necessity for the adequate lighting of wards when these drugs are being used owing to the need for accurate observation of the resulting cyanosis.

A case of gonorrhœa, which remained in hospital 71 days, is of interest in that after some considerable time without any success from sul honamid treatment it was discovered that he had been systematically "sunbathing". Suns rays are quoted as having a counter effect to the action of the drug. When his sun bathing was stopped his condition cleared up.

Extract from the Annual Report of the Medical Specialist, Deccan District, for the year 1939.

2. That on the whole the doses of the drug given are too small, either the daily total being too little, or if the initial daily dosage is adequate, it has not been continued long enough. In this connection it may be permissible to quote from an article by H. L. Marriot in the B. M. J., dated 11th November 1939, and which appears to be the standard dosage adopted by most authorities now, and has been advocated by many other authorities in current literature with very mild modifications. It is necessary in treating Pneumonia to aim at securing and maintaining a blood concentration of sulphapyridine of not less than 4 mg. per 100 cm. In adults this level is usually achieved by a dosage of 2 grammes, followed in 4 hours by 2 grammes followed by one gramme four hourly. After 2½ days the dosage should be reduced to 0·5 gramme four-hourly for 24 hours and then 0·5 gramme 8 hourly for 32 hours, *i.e.*, a total of 23 grammes administered on a decreasing scale during 5 days. The drug should be given in all cases of Pneumonia, however late in starting it may be, as it helps to prevent such complications as empyema, etc.

* * * * *

They were both British Troops, and were admitted with mild malaise, slight pyrexia, and discrete erthematous rashes, distributed chiefly on the back, the chest and the upper arms and legs. In neither case were there any definite physical signs, and in both cases, all symptoms cleared up completely within 48 hours without any special treatment. It is felt that both these cases are strongly presumptive of toxic reactions from the sulphonamide group, which must have been purchased privately as neither patient was on treatment from any Army source. Tests are being carried out at the British Section Hospital to see if there is any reliable test for the detection of the drug in the urine, and if there is, how long after the drug has ceased to be taken it will remain detectable. If any reliable evidence can be obtained a further report will be submitted. [The details of a suitable test have since this been circulated].

67. Surgery.

As can be seen from the list of operations and surgical treatments surgery for the Army in India covers a wide scope and provides very considerable diversity of practice for army surgeons. It is difficult to group descriptions of cases from the reports of numerous surgical specialists and it is therefore considered that the best picture can be given by quoting cases of interest.

(*i*) *Fractures* of course form a large proportion of military cases. Skeletal traction by pins and the use of Bohlers unpadded plaster fixation and traction using Bohlers special series of metal frames is specially mentioned by several surgeons. The uniformly successful results with absence of invaliding and the freedom of the patient are particularly noted.

Two cases of fractured pelvis with intra pelvic rupture of the urethra and other multiple injuries from riding accidents were successfully treated by passing and leaving in situ a rubber catheter without any local sutures ; plaster and extension dealt with the fractures. A fractured skull with middle meningeal rupture and uninterrupted recovery after trephining.

A lorry accident at Abbottabad filled the British wing of the hospital there with some remarkable cases ; a gross rupture of the liver ; a severe wound of the perineum and anum which recovered completely after gas gangene infection and a stormy convalescence ; a compound depressed fracture of the front of the skull w th extensive facial and scalp laceration which healed by first intention and 11 other less serious cases.

These cases and a severe chest wound case with massive surgical emphysema which recovered and many other cases speak volumes for the skill of the Nursing Services who were taken to assist with the cases and then left under trying hot weather conditions to complete the results of surgery.

Large numbers of fractures treated successfully with no case of invaliding from this cause were recorded at Kohat and special comment is made on the reliable work of trained I. H. C. orderlies in this theatre.

At Lucknow a B. O. R. with compound fracture of tibia and fibula developed gas gangrene, two days after successful excision of the wound. Gangrene developed to the level of the knee with marked gas formation and amputation was performed to the lower ½ of the thigh. He made an uninterrupted recovery.

From Ranikhet a case of excision of the head of the radius for comminuted fracture is reported. Two operations were performed and patient *returned to full duty* with very slight limitation of movements.

The value of portable X-ray sets is emphasised in the case of fractures and of gunshot wounds.

(*ii*) *Gunshot wounds.—Gunshot wounds* were in evidence in Waziristan. In Razmak 19 B. O. Rs. and 2 officers were operated upon for wounds, all recovered except a very severe abdominal case.

A case of gunshot wound below Pouparts left ligament with the bullet lying in the extra peritoneal tissues behind the rectum, having damaged the meso-colon, sigmoid-colon and rectum. Each portion was repaired and the left superior haemorrhoidal veins ligatured. The patient made an uninterrupted recovery.

A bullet wound which passed from the left thigh, mid-posterior aspect, to emerge above the right Pouparts ligament. Orchidectomy was necessary. Patient made an uninterrupted recovery.

A case of comminuted, compound fracture of the elbow from G. S. W. which required ligature of the brachial artery 4 days after successful toilet of the wound had been performed and plaster splinting had been applied. There was no sepsis, but the arterial bleeding came from the interosseous artery.

Gas gangrene.—The incidence has been surprisingly low. In over 300 cases of G. S. W. seen by the Surgeon at Razmak during 3 years there has been only 1 frank case of infection and 2 others where it was suspected in which excision of the wound was carried out. Sulphonilamide drugs were given in large doses to these three.

He also considers that anaerobic infection, though not proved bacteriologically, may account for certain cases of severe shock when the injury itself did not seem to account for the amount of shock.

(*iii*) *Other Surgical Cases. From Madras.*—A soldier with multiple enchondromata of the metacarpals of the left hand. The shaft of the 2nd metacarpal which was painful and swollen was excised and a bone graft from the tibia successfully put in. The result was satisfactory.

From Rawalpindi.—A lady with *acute haemorrhagic pancreatitis* was operated upon, the pancreas being incised and drained, the *gall-bladder* was full of stones and emptied and bile passages drained ; she was in extremis but recovered ; then became acutely ill with a *thrombosed splenic vein* but recovered from this ; then developed *diabetes* and finally recovered from everything.

Autotransfusion of blood from severe haemorrhage is mentioned as the method of treatment in two cases and success from drainage without removal of the appendix in children with acute perforated appendicitis is recorded in several cases (Ochsner-Sherren delay treatment).

From Lucknow.—A case of a Ranula of 6 months duration was reported and cured by operation. It was of such a size as to fill the floor of the mouth and to extend down to the cricoid cartilage to displace the sterno-mastoid.

From Ambala.—A typical case in a B. O. R. of Krohn's disease, chronic thickened regional ileitis, was operated upon with excision of the lower end of the ileum.

A B. O. R. with a cirsoid Aneurysm of the superficial temporal artery (L) due to a boxing injury 4 months previously was successfully operated upon and will be cured when the thrombosed mass can be removed.

A case of subcutaneous ganglion-neuromata was treated by excision of the painful tumours. The patient was a poor mental type.

A civilian case (a Wazir) was operated on 5 days after a history of sudden pain during heavy exertion suggesting possibly a perforated gastric ulcer. It was found that the splenic flexure, the colon and the spleen had been forced up through a rent in the diaphragm into the thorax. The patient's condition was hopeless when seen.

From Bannu.—A Hydated cyst of the left Erector spinal muscle which appears to have made a complete recovery. The man was in the I. A. V. C.

A branchial cyst which was removed from the left carotid and 2nd and 3rd cenical vertebrae of a young soldier from Manzai with uninterrupted recovery.

From Peshawar.—A case of malignancy of the right testical which proved to be a seminoma is of interest in that Friendmann's test (urine test for malignancy) was positive before the operative removal of the organ and although still positive was only one fifth of the previous degree 10 days after removal.

From Secunderabad.—A case of an Officer with a leather bottle stomach, diffuse fibrocarcinoma, diagnosed by X-ray and confined by subsequent operation at Home.

An Officer who was thrown out of a Tank. Seven hours later splenectomy and blood transfusion were performed for ruptured spleen. He made an uninterrupted recovery.

(*iv*) *Treatments. From Razmak.*—Oriental sore treatment with tartar emetic gave an average period of 4 weeks for a cure in 20 cases of oriental sore and in a number of other chronic ulcerative conditions which had repeatedly proved negative for Leishmaniasis.

Lerich's method of treatment of sprained ankle. About 40 cases were treated by this method, selection being governed by the time after injury. Success being given by treatment a few hours after the injury. The technique consists in injections of 2 per. cent Novocain into the exact ligament which has been injured followed by active movement (walking) supported with elastoplast. Great relief is felt and a 50 per cent improvement in the period of disability is obtained. The results appear to be due to relief of pain in the early stages.

From Cawnpore.—The use of a Zinc Gelatine glue for the treatment of sprains is described as being successful. This is heated until fluid and then applied as a fluid paste on to the shaven skin over the sprained part.

(*v*) *Blood transfusion.*—Comment is made that the service has improved but it is difficult to persuade donors to give blood even with the grant of concessions such as leave, etc. A central blood donor fund and payments for gifts of blood has been recommended and is in process of arrangement.

(*vi*) *Operating theatres* are steadily being improved as also is equipment although surgeons are inclined to complain of the quality of the latter. Lighting is a difficulty particularly where electric light is not available.

Stubb's shadowless lamp has been authorised for a number of hospitals.

An indigenous operating table made by a firm at Multan has been reported on as satisfactory in every way.

Heating or cooling of theatres is also a problem when external temperatures may vary from 20° F. to 115° F.

Cooling plants were installed as a trial by a civilian firm from Delhi for the Surgical Ward and Operating theatre at the B. M. H., Meerut, which have proved to be a great success, all work being carried out under better conditions and the patients benefitting by better results. Perspiration was reduced, fatigue diminished and cases healed by first intention. This theatre could also be utilised for the treatment of heat stroke. It had been hoped to make this plant permanent for the theatre, but funds not being available the permanent installation has had to be postponed.

TABLE 110

Surgical Operations—1939

Operations.	Total Number.	Re-covered.	Invalided.	Died.	Remarks.
King's Commissioned Officers (British Service).					
Ear, nose and throat	2	2	..	..	
Digestive	58	58	..	..	
Genito-urinary	9	8	1	..	
Bones, joints, muscles, fasciæ and bursae.	59	58	1	..	
Skin and subcutaneous tissues.	74	73	..	..	1 to U. K. for skin graft.
Tumours and cysts	19	19	..	..	
Blood vessels	12	12	..	..	
King's Commissioned Officers (Indian Army).					
Digestive	78	77	..	1	
Blood transfusion	1	1	..	..	
Bones and joints	55	47	4	1	3 still in hospital.
Skin and subcutaneous tissues.	108	108	..	..	
Injuries	2	2	..	..	
Tumours and cysts	2	2	..	..	
Genito-urinary	3	3	..	..	
British women and children.					
Ear, nose and throat	60	60	..		
Digestive	48	48	..		
Bones and joints	35	34	..		
Breast	4	4	..	.	
Genito-urinary tract	50	50	..	.	
Skin and subcutaneous tissues.	42	42	..	.	
Tumours and cysts	4	4	..	.	
Blood transfusion	1	1	..	.	

Operations.	Total Number.	Recovered.	Invalided.	Died.	Remarks.
Warrant Officers, N. C. Officers and men of the British Army.					
Eye	10	10	..	..	
Ear, nose and throat	52	52	..	..	
Blood vessels	51	50	1	..	
Glands	26	26	..	..	
Respiratory	22	22	..	..	
Digestive	490	484	1	5	
Male genitalia and urinary	178	178	..	..	
Skin and subcutaneous tissues.	825	824	1	..	
Tumours and cysts	77	77	..	..	
Limbs	6	5	1	..	
Bones and joints	620	617	2	1	
G. S. Wounds	26	25	..	1	
British all others (R. N. and R. A. F., etc.).					
Eye	13	13	..	..	
Ear, nose and throat	14	14	..	..	
Blood vessels	1	1	..	..	
Digestive	155	152	1	2	
Genito-urinary	68	68	..	..	
Bones and joints	122	118	2	2	
Skin and subcutaneous tissues.	235	234	..	1	
Tumours and cysts	15	14	..	1	
Blood transfusions	1	1	..	..	
Lymphatic system	5	5	..	..	
G. S. wounds	1	1	..	..	
Indian other ranks.					
Ear, nose and throat	55	55	..	..	
Digestive	273	265	..	8	
Genito-urinary	134	134	..	..	
Bones and joints	493	486	3	2	2 patients have been boarded out.
Skin and subcutaneous tissues.	842	842	..	..	
Tumours and cysts	79	79	..	..	
Respiratory system	5	4	1	..	
Blood transfusions	6	6	..	..	
Eye	33	33	..	..	
G. S. wounds	68	54	4	8	2 still in hospital.
Lymphatic system	33	32	1	..	

68. Radiology.

There has been a general increase in the work done, in some cases this has more than doubled in the past 5 years. A summary is given below and the complete table will be found in Part II.

Film papers are now used to a great extent especially for positioning fractures after treatment. But comment is made that the definition is often not so good with papers and that they do not store well owing to the tendency to curl.

Portable X-ray sets have repeatedly proved their value. In places where such are not available there is a strong demand for the provision of these sets.

The examination of pulmonary cases, pyelography, control and examination of stomach contents after barium meals are types of X-ray work which are increasing in our hospitals.

At Rawalpindi 7 Nursing Sepoys of the I. H. C. were trained and qualified in electric message.

At Quetta the new X-ray and electro-therapeutic block was taken into use and found to be eminently satisfactory.

Cases of interest were :—

1. A B. O. R. aged 23 with Marie Strumpell's spondilitis.
2. A B. O. R. aged 22 with Freibergs infarction.
3. A Sapper aged 35 with history of old injury. Radiogram showed a fusion of the 1st and 2nd right ribs into a broad plaque of bone and joining the sternum by a broad cartilage, deformity of the lower edge of the 7th cervical vertebra and a solution of continuity of the 1st rib suggesting ununited fracture.

TABLE 111

Summary of X-ray examinations for the year 1939

[Compiled from I. A. F. (Medical)-27.]

No. of patients examined—	
British	14,194
Indian	12,390
Civilian	2,007
Number and nature of examination carried out—	
Bones and Joints. Injury	16,403
Bones and Joints. Disease	2,869
Sinuses	853
Teeth	1,221
Lungs	4,056
Heart	195
Gastro intestinal	665
Liver and gall bladder	389
Urinary tract	1,041
Genital tract	217
Miscellaneous	629
Foreign body	74

Class in which a contrast medium was used and nature of medium—

Barium	598
Uroselectan B	131
Shadacol	174
Perabrodil	41
Pregnancy	119
Lipiodol	30

Miscellaneous information—

No. of ordinary film used	34,745
No. of dental films	5,287
No. of exposures	53,893
No. of X-Ray papers	4,112
No. of screen examinations	738

69. Anaesthetics.

The number of anaesthetics is given below and shows an increase of 462—

(*i*) The methods employed vary considerably with the predeliction of the anaesthetist and of the surgeon. Chloroform and Ether 1 to 4 followed by open ether is often the stock method. Shipway's apparatus has given valuable service in some stations. Magill's gas and Oxygen apparatus was favoured in the Western (Ind.) District. In Rawalpindi and Murree nitrous oxide and oxygen, with or without ether and with novocaine for local infiltration has been the standard method. Here spinal anaesthesia has not been used so much as previously, whereas at Bannu, Poona, Razmak and Bombay spinal anaesthesia using Percaine 1/5,000 (Hypobaric solution of Howard), 10—14 c.c. was much favoured. Sodium evipan was employed with satisfaction for a series of cases in several large stations. Rectal anaesthesia with Paraldehyde or Avertin has also been used over a series of cases. The Specialist in Razmak considers the results are good in giving prolonged post-operative rest with diminished shock, but at Quetta objection is made because it fails in some individuals and the method has been abandoned except for children.

One case is recorded of post-stovaine neuritis of the lower cord elements controlling the scrotal-gluteal areas and the rectum and bladder. Very slow partial recovery is proceeding. This unusual complication is considered to be due to a personal hypersensibility.

Investigation is in progress on the use and results of Nembutal-Hyoscine as a pre-operative sedative. Results are encouraging but not yet complete. So far the use of these drugs shows that at least 75 per cent are completely or to a great extent given amensia before the operations.

Di-vinyl ether was used on 4 occasions but it is costly and scarce. Results are good. Three cubic centimetres in a closed inhaler gives deep anaesthia for 70—90 seconds—induction under 1 minute and recovery with no vomiting immediately after removal of the mask. A locally made modification of Goldman's inhaler was used.

(*ii*) Premedication is extensively used by many anaesthetists : Sodium bromide grs. 40 and chloral hydrate 1 dr. followed at one hour before operation by hyoscine 1/100 gr. and morphia 1/6 gr. is one standard method. Others omit the morphia and use atropine 1/75 gr.

(*iii*) The need for adequate training or refresher training of sub-assistant surgeons is stressed by several anaesthetists and in several centres instruction has been given to officers and members of the I. M. D.

TABLE 112

Anaesthetics 1939

Anaesthetics.	Total Number.	
Chloroform and ether	995	
No. 20	72	
Novocaine 2 per cent (local)	649	
No. 20 and ether	137	
Ethyl chloride (general)	105	
Evipan sodium	185	
Spinal anaesthesia (stovaine)	56	
Ethyl chloride spray	124	
Vinestheme	2	Sent as sample and no good.
C. H. C. L. 3	1	
C. I. E. E.	60	
No. 2_2 O^2	118	
Local	87	
Cocaine 5 per cent	25	
Nitro oxide, oxygen and ether	626	
Nembutol	1	
Percaine	213	
Stovaine	12	
Pantocaine	9	
Rectal aether	3	
Evipan and nitrous oxide	2	
Cocaine 10 per cent	1	
Cocaine 4 per cent	12	
Cocaine 2 per cent	6	
	3,501	

70. Dental Conditions and Treatment.

(*i*) *Accommodation and equipment.*—Two entirely new dental centres were opened during the year at Calcutta and Quetta to replace other unsatisfactory accommodation formerly used at these stations. These centres are modern in design and commodious with good lighting and many other amenities. Improved accommodation was also effected at many other stations.

Modernization of the equipment was also continued by completing the provision of essential furniture. Electric storage water heaters and electric boiling plates were added to the equipment of many centres and provision

was also made to supply electric polishing and grinding lathes to other selected centres. Many instruments, drugs and sundries were added to the official scale of equipment for all centres.

Provision was also made to add to the Field Dental Outfits the equipment necessary for the early treatment of maxillo-facial injuries and wounds.

(*ii*) *Oral Hygiene.*—Oral hygiene remains good. This can be attributed to the personal interest of the men following the instruction given to them during their recruit days, as shown by the fact that many of them report voluntarily for dental treatment.

(*iii*) *Dental Treatment.*—The high standard of dental treatment afforded was maintained.

There were a number of cases of impacted mandibular third molars but cases of Vincent's infection were few.

Sodium-Evipan was found to be of value in the treatment of hospital cases requiring multiple extractions and for the reduction of fractures of the mandible.

There were nineteen cases of fracture of the jaw successfully treated. Four were treated by inter-dental wiring, four by splints and eleven by the use of skull and chin apparatus and bandaging.

More treatment was afforded to women and children and the numbers who avail themselves are increasing.

Figures relating to dental treatment are given in the following table :—

TABLE 113

Category.	Teeth extracted.	Teeth Conserved.		Scalings completed.	Gingivitis or stomatitis treatments completed.	Supplied with new dentures.	Dentures supplied.	Dentures remodelled.	Dentures repaired.
		Without root treatment.	With root treatment.						
British									
Other ranks . .	8,962	35,112	110	6,132	359	355	484	385	340
Officers . . .	30	12	...	2	5	...	...	1	1
Women . . .	1,464	1,360	3	152	51	18	24	4	2
Children . . .	944	715	2	16	23	...	...	...	...
Royal Air Force—									
Other ranks . .	321	1,320	29	129	9	14	19	12	20
Officers . . .	17	111	...	13	3	...	...	...	...
Women and children .	84	25	...	4	2	1	2	...	1
Naval ratings . .	24	5	...	...	...	...	...	...	...
Indian ranks . .	294	33	...	10	11	12	14	...	3
Total .	12,140	38,698	144	6,458	463	400	543	402	367

The total number of attendances for all categories of patients was 37,423.

71. Dermatology.

(*i*) *Dermal Leishmaniasis.*—At Quetta an investigation into the treatment of oriental sore was carried out. The comment in the interim report says "No conclusions have yet been stated. It would appear that the ideal treatment of oriental sore is still to be discovered."

A comparison of two methods of treatment of Dermal Leishmaniasis.

"Scraping" versus "Local injections of an Atebrin solution" has been carried out.

In the 4 years 1936—1939 (6 months only) 1,170 cases were treated. Multiple sores were commonest, 35·8 per cent; upper extremity sores were 34 per cent. 63·6 per cent of the total cases were in the Indian Cavalry Regiment in which unit the syces provided just half (49·2 per cent) of the cases. It was observed that 3 months to 7 months is the normal incubation period of a sore, the majority being in the 6th month.

Scraping treatment consists of erradication of the infected sore by a spoon-like scraper under a short general anaesthesia and subsequent dressing for 1 week by Tannic acid powder, then simple vaseline gauze.

The average duration of treatment by scraping was 4 weeks; 50 per cent being healed in 3 weeks.

Atebrin injection treatment (Captain I. H. B. Gosh, I.M.S.) consists of:—

First day: Hot 1 in 5,000 potassium permanganate compresses four hourly.

Second day: Injection into the base of the sore Atebrin solution 0·05 grammes per c.c.; done radially from at least four points on the circumference of the sore. No general reactions to the drug were noted.

Subsequently: Ointment-dressings are applied until healing is established. 33 cases were so treated and carefully recorded.

The average healing time was 26 days, 34 per cent healing within 3 weeks

Since local reaction is the aim of the injection treatment a solution of 50 per cent glucose for injection with local application of a tar distillate in collodion might well be as effective.

(*ii*) *Other skin diseases.*—These varied in types, fungoid infection classed as Tinea were among the most common. Typical sets of cases were as follows:—

At Rawalpindi: I. A. T. cases 19. Impetigo contagiosa 16. Eczema 10.

At Lahore. Scabies, Tinea ruris and seborrhoea. Here the average stay in hospital was 12·7 days.

At Calcutta. 62 cases were treated, the majority being Tinea.

At Meerut a case of Sycosis Barbae was treated with Uleron and developed peripheral neuritis after 4 tablets. He had had some kind of previous treatment. He recovered from both conditions.

(*iii*) *Venereal diseases.*—Preventive ablution rooms have improved in equipment and in the trained personnel in charge thereof. The provision of ample warm water, adequate lighting and a supply of preventive packets are the main items of importance. Much attention is given to these rooms by Commanding Officers and to the subject of prevention of inefficiency by these preventable diseases. It is considered by some C. Os. that severe measures imposed on those who acquire venereal disease are the best deterrants; but others as emphatically consider that the reduction or loss of privileges from 6 to 3 months produces better results in the admissions to hospital.

One aspect of these "Rooms" which requires careful supervision is that of the records which are maintained showing that the treatment has been used. Such records must be checked *daily* to ensure that antedating of the "chits" is not possible.

The figures of treatments and cases at Karachi are of interest.

P. A. Room Karachi.	1935.	1936.	1937.	1938.	1939.
Cases treated . . .	456	246	434	747	604
Total infections . . .	5	2	10	28	3

The outstanding feature of these diseases is of course the complete change established in the treatment of gonorrhoea by the Sulphapyridine group of drugs and, in particular, M. & B. 693. Gone are the days of 2 months stay in hospital for gonorrhoea. The average length of stay is now reduced to 18 and even 14 or 12 days and must be reduced still further. Gonococci disappear in 2—3 days and the discharge dries in 3 to 8 days. The absence of complications and relapses is a notable feature. The following examples are typical :—

At Karachi . .	Previous average stay in hospital . .	65 days.
	11 cases treated with Sulphanilamide .	40·9 ,,
	58 cases treated with M. & B. 693 .	14·4 ,,

At Rawalpindi . Average number of days in hospital.

	1935.	1936.	1937.	1938.	1939.
Fresh gonorrhoea . . .	50	43	34	31	*17
Relapse gonorrhoea	37	40	27	25	

One case of minimum time in hospital is worth mentioning.

While serving a sentence of detention he developed gonorrhoea, was admitted and put on treatment with M. & B. 693. Owing to difficulties in finding a guard owing to war activities, he was discharged next day and continued his detention and his treatment from the M. I. Room on ordinary diet. He made a perfect recovery.

Routine methods of treatment have now been adopted, the principle being to develop a high concentration of the drug in the body as soon as possible and discontinue before toxic results can develop. 28 grammes (56 tablets) over 4 days is one routine method. This may be repeated. No local treatment is given and the method of allowing immunity to develop by withholding treatment for a week is being discarded. In many cases now ordinary diet is allowed to patients under treatment.

The case of a patient who required 71 days in hospital because he sunbathed is referred to in paragraph 66.

With the prevalence of these drugs in the bazaar and the widespread knowledge of the ease with which treatment can be carried out it is quite certain that men are resorting to bazaar treatment. Cases of Urethritis without any organisms present are becoming common. In addition there is the danger that patients may receive gross over dosing because illicit treatment from bazaar practitioners is not acknowledged when they are admitted finally for treatment at the military hospital. Cases of toxic results and even a death have been reported.

For syphilis standard methods of diagnosis and of treatment are laid down and give satisfactory results.

A case is recorded of Tabes dorsalis in an Assistant Surgeon which showed remarkable improvement even at that late stage under treatment with Tryparsamide, and his cerebrospinal fluid showed a reversal of reaction.

One case of syphilis while under arsenical therapy developed haemorrhagic enephalitis and died.

* Includes 4 very resistant cases who averaged 71 days.

Several officers comment on the indifferent response given by Indian troops to antisyphilitic treatment compared with the 100 per cent successful treatments for British troops. Various reasons are suggested including the chances that the treatment prescribed never reaches the patient for whom it is intended.

(*iv*) *Chancroid.*—The effect of the Sulphapyridine drugs on these conditions has been tried out at Poona.

47 cases of chancroid were treated with a routine dose of Sulphonamide P : 2 tablets T. D. S. for 10 days. It was found that their average stay in hospital was 16 days whereas the average stay of the 47 previous cases not so treated was 31 days. These results are considered to be due to the inhibitary action on secondary infections.

72. Mental Diseases.

(*i*) *Hospital accommodation.*—The modern tendency is to do away with the prison-like accommodation existing from former unenlightened times. At Lucknow comment is made that at the B. M. H. the mental block is eminently suited to a prison but not for treatment of mental patients while at the I. M. H. there is no accommodation for any treatment and no trained attendants.

The method of "boarding out" mental cases into the medical wards has been satisfactorily employed in Southern Command.

From Northern Command a plea is made for the treatment of British mental cases in a Hill station during the hot weather since the majority can be accommodated in an ordinary ward ; also for a rational regard for insane cases who should be treated as other sick men in that they can no more help being insane than another patient can help having cancer.

The question of providing a combined British and Indian mental block has been receiving attention at Quetta.

(*ii*) It is noted that there has as yet been no obvious increase in mental admissions due to war conditions except that the increase in Northern Command of 11 cases and the rise in age incidence is attributed to the calling up of Reservists many of whom were in a poor state of health.

(*iii*) *Interesting cases.*—Two cases of interest were invalided amongst British troops.

At Quetta.—A sergeant who developed severe hysteria subsequent to a neuritis following on an A. T. S. injection ; and a Fusilier with visual and auditory hallucinations.

There was an Indian case of depressive apathy which cleared up after treatment for ankylostomiasis.

At Rawalpindi.—Organic causes for the mental state are carefully investigated, one case diagnosed Schizophenia made a dramatic recovery as soon as his impacted wisdom tooth had been extracted. General paralysis of the insane and Tabes were also found as causes of disability in Indian troops, contrary to popular opinion. Psychotherapy was successfully employed on two cases of hysteria and cardiazol produced marked improvement in 3 cases of Schizophrenia pending invalidment. Unfortunately the price of the drug has increased and availability has decreased.

73. Ophthalmology.

Large numbers of patients are seen by our Ophthalmologists. The eye specialist at Quetta who was new to Indian conditions comments on the extreme mildness of the trachoma which he has seen and the slight amount of permanent damage which appears to be caused. The typical linear scar is usually absent and only careful, well illuminated examination reveals the extent of the old infection. Acute conjunctivitis tends to light up the trachomatous conditions and he finds the best cure is conjunctival painting with silver nitrate 1 per cent on alternate days which clears the trouble in a month.

His conclusion is that Trachoma as it is experienced in the Indian is no bar to enlistment in the Army unless it is very marked or in an early stage.

On the other hand an experienced Ophthalmologist in South India makes the following observations :—

" A certain number of recruits are being passed as fit, though affected by a mild degree of Trachoma.

Trachoma is likely to spread rapidly under active service conditions and in many previous wars has caused very great disability. Under the circumstances, it appears to me that it is unwise to admit even mild cases."

In Northern Command, no trachoma was seen in British personnel but trachoma together with conjunctivitis, ulcers and nebulae were the common conditions amongst Indian personnel. Pterygium was also fairly common. Conjunctivitis was found to be most common at the beginning and the end of the hot weather.

In Western (Ind.) District an investigation into the ocular complications of malaria is in progress, several hundred cases having been examined. A case of sudden loss of vision in one eye following atebrin treatment is described and thought to be due, in the absence of any pathological signs, to retro-bulbar neuritis.

Two cases of syphilitic infection were noted, one with completely symmetrical macula-choroiditis of about 1½ discs diameter, the other a rare case of acquired interstitial Keratitis.

A British corporal with a visual acuity of 6/18 each eye and a Fuchs inferior crescent below each optic disc, was not improvable in visual acuity by glasses. Never the less he was a " marksman ".

An important observation is made by the Ophthalmologist, Rawalpindi district, on the eye conditions of clerks in which he draws attention to the bad conditions of lighting in their work places.

" Every year a large number of men of the C. M. A.'s Department attend the Eye Department for advice. Symptoms of Asthenopia amongst them are common and the onset of presbyopia earlier than normal. I find that the offices in which the clerks work and the light conditions in which they work are highly unsatisfactory. It is recommended that these conditions be looked into and rectified."

This observation applies to many " Departmental " offices where the fact is constantly overlooked that one cannot get good work from bad lighting. Reference has already been made to this subject in connection with factories and workshops. Paragraph 64-G.

From Rawalpindi one remarkable case is recorded of a Follower who became thoroughly drunk on a Saturday on methylated spirit and wood alcohol; after stages of vivid coloured lights he became blind on Sunday.

Large alkaline drinks cleared the temporary condition after a week, but a fortnight later progressive optic atrophy produced total blindness.

A case of remarkable recovery was of a 3 year old girl with thick corneal opacity after injury by lime which cleared almost completely after 2 months treatment.

Trauma cases were frequent, including a B. O. R. with a riccochet pellet from a dog-shooters gun, a boy falling on to a stick, and damage from hockey sticks, tennis balls and footballs.

Malingering which had been absent last year has reappeared on the outbreak of war, particularly amongst reservists. Night blindness is the commonest pretence. It is most catching. 5 cases have been detected and were awaiting trial in one large station.

Night blindness or alleged night blindness has also been reported from Southern Command amongst motor drivers after the outbreak of war. Such complaints are most difficult to refute.

The specialist of the area concerned makes the following observations :—

" Several cases of supposed night blindness have been coming for examination recently (since the outbreak of war). The interesting points in these cases are as follows :—

(*a*) Nearly all these cases are from M. T. Units.

(*b*) Nearly all are reservists.

(*c*) At present, no case has shown any pathological evidence in the fundus.

(*d*) There has been no evidence of vitamin deficiency.

(*e*) None of these cases have previously complained of this disability.

Similar cases also came up for examination in Poona, and they all came under the above categories. The inference is, of course, obvious."

From Lucknow a case of Herpes Zoster Ophthalmicus with very severe symptoms which cleared up completely with two doses of anti-diphtheritic serum is reported. Three cases of night blindness, 2 Indian and 1 British, were carefully investigated, but no direct cause could be found.

From Poona it is noted that Homatropine and Cocaine do not react as well with Indians as with British patients.

A case of spindle-celled sarcoma of the Choroid in a young British soldier was diagnosed and enucleation performed.

74. Oto-Rhino-Laryngology.

Accommodation at Rawalpindi and Murree is satisfactory.

The number of attendances and operations has decreased slightly compared with last year, 4,460 and 520 respectively in place of 4,709 and 585. Waiting lists have been reduced to current cases.

A case of multiple foreign bodies in an Indian boy is noted in which a stone was lodged firmly in the ear and a " pice " piece in the aesophagus X-ray showed each clearly in position and removal was successful under general anaesthesia.

A B. O. R. with a posterior obstruction of the left nostril by a thick membrane was operated upon but the atresia which had been present since birth recurred in spite of repeated attempts at dilation.

In Meerut District there were 568 new cases and 2,700 cases treated as out-patients. These included 3 emergency Schwartz's mastoidectomies 2 B. O. Rs. and W/O of a British Officer.

Invaliding :—

3 I. O. Rs. for intractable bilateral disease with deafness.

3 B. O. Rs. for sinusitis for which he had been invalided 3 years before.

During the summer the department moved to Landour where electric power is available and a large number of patients were treated successfully under good conditions.

The use of R. A. F. transport for emergencies is advocated.

75. Rabies and Antirabic Treatment.

There have been seven cases of Hydrophobia, three British and four Indian. Of the British cases one was a Corporal R. A. M. C. who knowingly refused to accept treatment in order to sit for a Corps examination.

Rabies has not been noted as being markedly prevalent in any District though it was noticeable in Baluchistan and in the Bareilly area.

Antirabic treatment has been administered widely during the year. We now have 57 treatment centres and if need be vaccine can be sent from any of these centres to out-lying hospitals for local treatment.

During the year consequent on the closure of the Pasteur Institute at Kasauli and its amalgamation into the Central Research Institute a new procedure for the issue and accounting for vaccines has been arranged. Simultaneously a new classification of bites and licks and of their treatment has been published and brought into effect.

Certain Institutes have adopted this new procedure, details of which are summarised as follows :—

All bites are classified into three classes, slight, moderate or severe. Minute details are given concerning the situation of licks, bites, etc., so that no difficulty whatever can arise as to the class into which any particular cases should be put.

A five per cent vaccine is issued for the treatment of all classes of cases, the dosage and length of course corresponding to the class into which the case has been placed. The treatment recommended is as follows :—

Class I Slight . . .	2 c.c. daily for 7 days (adults and children).
Class II Moderate . .	5 c.c. daily for 14 days (adults and children).
Class III Severe . . .	5 c.c. daily for 14 days (children).
	10 c.c. daily for 14 days (adults).

The above classification and dosage of vaccine has now been adopted by the Pasteur Institute, Coonoor, and the Haffkine Institute, Bombay, in addition to the Central Research Institute, Kasauli.

The Pasteur Institutes at Calcutta and Shillong issue their own instructions concerning the treatment of cases treated with vaccine supplied from those Institutes.

The method of issue and payment for vaccine varies in each Institute according to their own regulations. All Military anti-rabic centres conform to instructions issued by the Institute from which they obtain their vaccine.

The following summary shows by Districts the number of anti-rabic treatments which have been carried out. Full details are given in Part II of this Report.

Peshawar District	93	Bombay District	69
Rawalpindi District	133	Madras District	31
Lahore District	208	Deccan District	230
Kohat and Waziristan	106	Jubbulpore Area	33
Northern Command	540	Southern Command	363
Lucknow District	243	Western I. D.	142
Meerut „	324		
P. & A „	58	Weastern I. D.	142
Delhi Area	78		
Eastern Command	703	Total	1,748

76. Women and Children.

A. *Diseases and treatment. Families Hospitals (British)*

(*i*) *Hospitals, staffs and equipment.*—The work in family hospitals and antenatal work connected with Welfare clinics appears to be steadily increasing. The comment is made in one large typical station that the year has been a successful one and the staff has produced results of which they may well be proud.

The new families hospital at Rawalpindi and its counterpart at Murree continues to allow admission to a large and varied clientelle including the wives of three Indian Officers. Lady Minto Nurses were frequently required and a similar number of local nurses were engaged.

Comment is made on the need for more permanent staffs of I. H. C. for family hospitals, particularly kitchen staffs on whom so much of the well being of the patients depends.

At Quetta the new families hospital has taken 121 in-patients, over 950 patients have attended as out-patients and to the antenatal clinics, 64 births took place and 393 successful surgical obstetrical and gynaecological operations carried out.

In many stations Friedman's pregnancy test has been usefully employed with a hundred per cent positives.

The use of a Walton-Minnett gas apparatus for analgesia proved of great value ; the apparatus is simple and cheap.

(*ii*) *Principal diseases. Malaria.*—Admissions for women have shown a remarkable decrease in the northern districts ; for example in Rawalpindi District the sick rate of 29 per 1,000 of 1938 is reduced to 8 per 1,000 in 1939, a figure never recorded before. This reduction is attributed to (*a*) the fact that owing to the war women and children were kept up in the hills longer than usual ; (*b*) the general freedom of these northern areas from malaria : admissions for children for malaria are down to 6 per 1,000 whereas the dysentery-diarrhoea group produced 56 admissions per 1,000.

The Dysentery-diarrhoea group has as usual been much in evidence often producing the most severe cases and the greatest tragedies. Many cases required prolonged treatment and the use of anti-dysenteric serum. The incidence of dysentery-diarrhoea has been heavy in Quetta, Rawalpindi, Lahore, Lucknow and the Madras Districts. In Lucknow District 50 per cent of all deaths of children were due to the dysentery-diarrhoea group.

The need for early hospital treatment for acute dysentery and diarrhoea and the special need for pressing the fluid intake in the case of children is stressed. This is a point to which education at Welfare Centres should give particular attention.

A further point is to make mothers, nurses and even medical men realise that the condition in children is more often than not a dysenteric infection and that this group " dysentery-diarrhoea " should be labelled, called and treated as " dysentery ". The expression used by a mother or medical attendant " just a touch of diarrhoea " is a misleading euphemism which so often produces a fatal delay in carrying out the required energetic treatment. Parents should be made to realise that the child has " dysentery ", the infection being due probably to flies or bad hygienic methods in their own household.

In one fatal case of diarrhoea quoted from Deccan District the child's ayah was examined and found to be suffering from dysentery, B. flexner isolated from the stools, and two other children in the same family developed dysentery.

From Quetta the following observation has been made by the Deputy Assistant Director of Pathology :—

> As in previous years the dysentery season opened with Sonne dysentery among the women and children. This regularity is most extraordinary, particularly as fly breeding in April is slight. Some of the Sonne dysentery cases were severer than in previous years.

Diphtheria began in Sabathu at the end of July and 15 cases in all occurred between the 26th July and 15th September. Early in August all children were immunised ; T. A. F. 3 doses at weekly intervals.

Several of the immunised children developed the disease in mild form The need for warning parents that immunity takes some time to develop is stressed.

Chicken pox was markedly prevalent throughout Lahore District and Rawalpindi. This started as a spring wave in Ferozepore, spread to all the hill stations and returned in the autumn to plains stations.

(*iii*) *Items of interest.*—Two cases of pyloric stenosis are recorded, one was successfully treated by Ramstedt's operation under local anaesthesia and the other by dieting and belladonna therapy.

A girl of 8 years who had had two doses of T. A. B. had a severe attack of Typhoid fever.

A woman aged 40 with acute, severe ring worm of the nails of both hands was completely cured by the eradication of all nails under general anaesthesia. 10 months later she was cured and her nails had regrown.

An infant aged 8 months was found to have an infection with B. typhimurium (B. aerthycke) and was cured.

A girl aged 7 was admitted and treated for chorea. After 10 days she developed typical typhoid, proved bacteriologically which ran a normal course. For convalescence she was sent to Wellington and there developed diphtheria bacteriologically virulent and difficult to eradicate. She recovered completely.

Two cases of births at 7 months are mentioned, the infants weighed 4¼ and 4¾ lbs. respectively. They survived and are flourishing.

Six cases of tropical Typhus were admitted in Lahore District : 4 at Dagshai and one each at Sanawar and Kasauli.

Typhoid fever.—The wife of a staff-seargent went down with Typhoid fever in Calcutta. She had never been inoculated with T. A. B. but had received " Billi-vaccine immunisation ". She recovered.

" *Typhoid Carriers* ".—Attention was drawn by the Officer in charge of the Enteric Laboratory, Kasauli, to the fact that the Ayah at the families hospital at Jutogh was and had been for some time a proved " Carrier ". She was still employed. Steps were immediately taken to stop this risk. She consented to operation. The gall bladder was removed successfully and she returned to duty completely cured.

Finally this dramatic case of auto-transfusion is worth recording. The wife of an assistant surgeon suffering from a ruptured ectopic was collapsed from extreme haemorrhage. The blood was baled from the peritoneal cavity by means of a common tea cup, it was filtered through gauze and returned to her by means of a transfusion apparatus into a vein.

After an acute reaction she recovered.

During the year the incidence of tuberculosis amongst the Indian civil population has been receiving consideration from the civil authorities. The incidence amongst military families is shown in the following Table :—

TABLE 114

Tuberculosis amongst women and children of the British Army in India.
Actuals

	Pulmonary tuberculosis.		Non-pulmonary tuberculosis.	
	Women.	Children.	Women.	Children.
1919	2	1	2	2
1920	16	..	..	1
1921	11	2	..	..
1922	12	2	..	..
1923	4	1	..	2
1924	8	1	1	..
1925	13	4	1	..
1926	17	1	..	1
1927	5	2	..	..
1928	8	2	..	..
1929	9	..	..	8
1930	10	..	..	..
1931	14	3	..	4
1932	5	1	..	4
1933	6	1	2	1
1934	6	3	1	3
1935	3	..	3	3
1936	6	2	2	2
1937	6	1	..	2
1938	8	1	1	6
1939	1	1	..	8

B. *Schools.* (*British Children*)

Annual reports on the physical condition of the children are received from all schools. These indicate in detail the physical condition and development of each child and show the amount of attention the children receive,

The general health and development of children in these schools has been good. The outstanding defect shown by many reports is the condition of their teeth. In one large district the proportion with defects was 33 per cent. Many parents do not seem to realise the importance of adequate care of the teeth by daily attention. In some measure it may also be due to defective feeding, though the appearance of a majority of children does not suggest any lack in the quantity or quality of their feeding. At several schools milk, a pint *plus* a sterile straw, is provided for 1 anna and some 75 per cent of the children take it.

School buildings have been improved in many places by additions or alterations. New school buildings have been provided at long last at Dalhousie where an excellent well lit school room, a suitable cloak room, ablution room and storeroom have been added. At Cliffden it was hoped to provide an enlarged school but war has made this impossible.

Drinking fountains and a safe piped water supply have now been provided in a number of schools, this is an important point in places where the restless school child requires an ample amount of drinking water.

Lighting in many schools is still far from satisfactory and artificial lighting where it exists is poor. Attention is being paid to this point.

Positioning during work is a matter which requires constant care and efforts are being made to make teachers position-conscious. In conjunction with positioning during work special attention has been paid throughout the year to the question of seating of school children. Early in the year a circular was issued to all concerned giving the points which needed special supervision as regards size, shape and placing of desks and as regards size and shape of the chairs, the criterion being comfortable upright posture with feet firmly placed flat on the ground. It has been found that little difficulty occurs in obtaining satisfactory results for each child if the school mistress obtains the co-operation of the M. E. S. to get the right size desks and chairs. There has been a very marked improvement in the provision of proper desks and seats for children in our schools during the past 15 years.

C. *Child Welfare and Welfare Centres, Indian Families Hospitals*

British.—(*i*) For British families welfare centres as such do not exist on similar lines to those enjoyed in the United Kingdom. In India the British Families Hospital tends to take the place of the Welfare Centre. Children are seen there, antenatal work is conducted there and the medical officer and matron are there available for every aspect of the care of babies and children.

(*ii*) In the bigger stations child welfare committees do exist and fortnightly meetings are held. These are however usually in the nature of Mothers Union meetings and the principle activities of the movement are the supply of suitable infant and children's foods at wholesale rates and the provision of wool and materials to assist the more needy.

In some, baby weighing is undertaken and records kept and lectures and discussions are held on the various aspects of baby and child management in an Indian Cantonment.

The work is appreciated and does good, but the amount that is done depends on the initiative and capabilities of the leading ladies.

Indian.—Once again all reports record how child welfare work has increased steadily during the year. Its value is recognised more and more, not only by the married Indian soldier or follower, but by the officers under whose command these men serve. Difficulties of caste, class and religion still form a barrier to free use by all, but the value of the work of Centres and of Hospitals is such that these barriers are being steadily broken down.

In this connection it is worth recording how the barriers of caste and religion can disappear by persuasion when the ultimate benefit of the children is the stake. In an Indian Cavalry Regiment a school has been formed for children who are beyond the infant welfare stage. In this school all children sit down and work together irrespective of the rank, class or caste of their parents. At a British Military Hospital in another station a similar school for the children of the men of the Indian Hospital Corps shows the same mixing of the classes and castes.

At present there is really no clearly defined division between the work of child welfare centres, such as prenatal care of the prospective mother and postnatal care of the infant and mother, and the work of a families hospital including the treatment of all women and children, the work of welfare for children in the lines and even the education of children of military personnel. The tendency in many stations is for the treatment side of this work to develop in importance at the expense of the pure child-welfare work in the lines. The former is often more popular and appreciated by the women themselves because it is the most apparent need and produces the most obvious results which can be immediately noticed. But there is no doubt that the child welfare side of the work is producing very beneficial effects and is steadily gaining ground.

It is doubtful whether these different aspects of work for women and children can ever be really separated ; but the hospital treatment side of the work is the one in greatest demand and now directly affects the health of the troops concerned.

The number and scope of Indian Troops families hospitals is steadily increasing ; examples are at Quetta and Jhelum and the time is in sight when the maintenance of an Indian Troops Family Hospital in each station will be the responsibility of Army Headquarters.

Three quotations from reports by experienced officers may be given in illustration of this. The S. E. M. O. of Sialkot writes :—

> "I consider that the Child Welfare Centres have done excellent work during the year. They have been popular with the troops' families who realise what a boon such institutions are. In this station one can confidently say that the wives and families of Indian troops get the same medical care as their husbands."

from Roorkee we hear of a very wide scope of activities including welfare centres with prenatal and post-natal care, infants and older children's schools, the formation of troops of Bluebirds, Girl Guides and Boy Scouts and a flourishing well-staffed family hospital. The S. E. M. O. writes :—

> "There can be no doubt of the value of the families hospital to the health of the troops ;.....now that women and children

are treated it is found that the numbers admitted to the I. M. H. are less..... One feels that one must return thanks to the self sacrificing work of the wives of British Officers in the station for the time and energy which they have given to this work."

The A. D. M. S., Rawalpindi district remarks as follows :—

"I am of the opinion that the welfare work amongst the families of I. O. Rs. and followers living in unit lines is an important measure to reduce the sickness in the Army. I hope that the financial assistance from various funds to welfare institutions will be continued during the present emergency."

The D. A. D. H. Peshawar District reports as follows :—

Peshawar.—12 unit centres function very well and great interest is taken by various voluntary workers.

Hospital admissions are to the Zanana Hospital where the new Strettell Ward was completed and opened. The old labour ward has been rebuilt and is now used for the lower classes of followers' wives. The grounds have been laid out afresh and the staff quarters have been rebuilt. This is now a very good modern hospital of 30 beds, where very good work is done.

Nearly all annual reports emphasise what a debt the movement and the families of Indian troops owe to the zeal, energy and financial assistance of the wives of British Officers. Medical Officers, Assistant and Sub-Assistant Surgeons also give much help in this sphere.

(*a*) *Approximate average strength of women and children (Indian)*—

Women.	*Children.*
22,991	32,202

(*b*) *Approximate numbers dealt with by Welfare Centres.*—The actual numbers dealt with at Welfare Centres and Family Hospitals have been steadily increasing at nearly all stations. But greater accuracy is still needed in the maintenance of records if the real numbers of cases treated is to be known rather than attendances. Where staffs are small and the record is kept by the nurse the tendency is to record attendances, thereby swelling the apparent amount of work accomplished and enhancing the professional ability of the nurse. Improvement is being obtained by the maintenance of proper registers and the entry of cases and attendances in separate columns, the former being given serial numbers or in some cases, as at Jhelum, being given tickets.

The number of cases seen at the Centres or treated at the Family Hospital is a criterion of the value of the work done in that station, depending on the popularity and zeal of the administrative personnel, and is n t an indication that the health of the families is worse in stations which show large attendances, treatments or variety of disease. In fact the better the families are cared for the fuller are the records of cases.

The approximate numbers dealt with during the year were :—

Women.	*Children.*
67,861	99,338

(c) *Progress of the work done.*—The work of Welfare Centres and family hospitals has definitely progressed during the year. If funds are adequate speedy increase is possible ; but in practically all stations the work is carried on under a constant struggle for funds to meet the increasing demands.

The scope of the actual work itself is increasing in that greater numbers avail themselves of prenatal assistance and require hospital accommodation for their confinements, greater attention is being given to the education of mothers in infant feeding and care of the older stages and the treatment of illness is developing to afford full hospital facilities to cases which need it.

At Jhelum a new families hospital has been opened and welfare centres flourish. At Quetta an Indian Army Welfare Association has been formed and arrangements made for all work to be centralised under its control. It is said that the Gurkha Hospital will be utilised for lying in cases and it is hoped that the isolation hospital of the B. M. H. may form a new Indian Families Hospital ; this will however require certain alterations costing Rs. 5,000. With the expected occupation of nearly 600 more family quarters during 1940 in Quetta extra family hospital accommodation will certainly be needed and 3 more clinics will be necessary. At Peshawar the completion and equipment of the new Strettell Wards has provided the Zenana hospital with vastly improved accommodation and facilities.

Difficulties are still experienced in obtaining suitable lady sub-assistant surgeons who will remain in their appointments and no candidates could be obtained from military welfare centres for a special course held in Delhi for the training of Health Visitors.

(d) *Accommodation.*—The majority of Welfare Centres are established in reappropriated married quarters which with conversions and additions form very suitable accommodation. Conversions and improvements in amenities are carried out by private funds and in a majority of cases give most excellent results. The greatest lack is that of artificial light and of piped water supply. As regards the latter it is a serious hardship and considered by many subscribers entirely unfair that welfare funds or family hospital funds should be expended on water charges for Indian troops families who are already entitled to free water.

The accommodation of Indian family hospitals is often excellent for the purpose such as at Peshawar, Kohat, Chaklala, Jhelum, Sialkot, Agra, Roorkee, Bangalore and Jhansi. There is a constant demand for more beds.

Family hospital accommodation is not provided where a Cantonment General or Civil Hospital offer sufficient facilities.

In addition to hospitals and centres special facilities such as hot baths, playgrounds and purdah gardens are being made available for Indian troops families.

In all there are now 84 Welfare Centres established : Northern Command 35, Eastern Command 26, Southern Command 18, and Western Ind. District 5.

(e) *Staffs.*—During the year 18 lady sub-assistant surgeons and one male S. A. S. were employed. Twelve of these are paid from Government funds

and the remainder from the Indian Expeditionary Force Canteen Profits Fund. Suitable lady doctors of the class required who will stay in their jobs are difficult to obtain and some of them require to be handled with considerable tact.

This need is however not entirely one-sided, because similar differences of opinion arise amongst those who control the activities of welfare centres and family hospitals. The officers and ladies of wealthy units which have had welfare centres going as flourishing concerns for some years are sometimes very loathe to combine in a station welfare movement or to share a troops family hospital with units not so fortunate. S. E. M. Os. and medical officers have no easy job at times to obtain the willing co-operation of all who consider that they should have a say in the control of affairs.

Unified control on a station basis is essential if Welfare work is to play its full part in the improvement of the health of Indian families.

In addition to the doctor family hospitals have one, two or even three trained nurses, trained *dais* and sweeper staff. In welfare centres the staff usually consist of a trained nurse, either resident or visiting, a trained *dai* and a female sweeper under the direct supervision of the Regimental Medical Officer who works in conjunction with one or more senior ladies of the unit.

(*f*) *Funds.*—A very large proportion of the funds come from subscriptions of the men themselves aided by generous subscription from officers and their wives. For example in one typical station with a family hospital and seven welfare centres subscriptions provided Rs. 6,000 and donations and grants from central or charitable sources only Rs. 900. The greatest strain however, is on those responsible for the work in small stations and in the smaller units.

The actual sources of funds are as follows :—

1. Subscriptions from the men, aided by contributions from officers and their wives or regimental funds in the case of rich units.

2. Payment of the salaries of 12 lady sub-assistant surgeons by Government.

3. Payment by lump sum grants amounting to Rs. 55,266 from the Indian Expeditionary Force Canteen Profits Fund for payment of 1 male sub-assistant surgeon and 6 lady sub-assistant surgeons; and for capital outlay on welfare centres, including building, alterations, repairs, fly-proofing, electric light and fans, laying on water and provision of furniture, bedding and equipment.

4. A sum of Rs. 10,850 from the Indian Expeditionary Force Canteen Profits Fund allotted to the Maternity and Child-welfare Bureau, Indian Red Cross Society.

5. The Maternity and Child-welfare Bureau allots a sum of approximately Rs. 32,000 to British and Indian Welfare Centres made up from item 4 and various other sources.

Funds obtained from 3, 4 and 5 are amalgamated and distributed under the management of a committee of which the Secretary is the Director of the Indian Maternity and Child Welfare Central Bureau. This distribution

is based on the estimated needs and the demands received from all centres in their Annual Report and Budget Request Forms, Form A. G. 26.

It should be noted that the funds available for distribution can only meet about two-thirds of the closely scrutinised demands.

(*g*) *Confinement*).—Improvement is recorded during the year in that the proportion and numbers of births dealt with at Centres and at family hospitals have definitely increased. For example at Almora 88 cases were confined in the lying in wards of 8 beds and no single case was confined in the lines ; at Ambala in the M. A. T. C., with a married strength of 142 officers, other ranks and followers, 24 successful confinements were conducted in the Centre ; at Lucknow 140 successful confinements in the Centres ; at Abbottabad at large majority of all confinements are in the hospital or centres and at Roorkee so successful has been the work that the wives of men who have been transferred actually come back to the family hospital in Roorkee for confinement.

An experienced lady comments in an Annual Report that " this side of the work justifies any amount of trouble."

The control of infant feeding has also been receiving particular attention.

(*h*) *Principal diseases. General.*—Diagnoses are in many cases somewhat inaccurate, being based on the knowledge or whim of the Nurse ; but with increasing supervision by qualified medical personnel and the maintenance of proper records diagnoses and records are improving in accuracy, the former being based on proper laboratory or clinical side room examinations.

The tabulated list of principal diseases is given below at the end of this paragraph.

Malaria.—Diagnosis of this has been improved by extended use of laboratory or clinical side room examinations. Where possible malarial treatment has been delayed pending proper diagnosis or withheld unless clinical evidence is conclusive. Laboratory diagnosis is specifically mentioned in 12 main stations. The proportion of malarial cases is large but decreases are noted in the extreme north, Abbottabad and Peshawar District. High malarial admissions are recorded from stations in the U. P., Eastern India, Bombay and the Deccan.

In several stations full courses of Atebrin and Plasmoquine are given in lieu of quinine.

Spleen counts were systematically carried out in a number of stations, in some cases once, in others twice yearly, and in several stations all new arrivals are also examined. All cases found with enlarged spleens are treated with courses of Quinine or in a few instances with Atebrin and Plasmoquine. It is claimed that this has a very material effect on the health of the troops. The difference in spleen counts in and out of Cantonments is well illustrated by those at Jhelum :—

Enl arged spleen—

In Cantonments	8·2 per cent in children under 12 years.
	3·8 per cent in children over 12 ye ars.
In villages outside Cantonments .	29·1 per cent in children of all ages.

A point which arises in carrying out full treatment is that it is especially difficult to ensure that family-patients continue their treatment to its end. They are exceedingly inclined to stop as soon as fever and symptoms subside. (It might be mentioned that British Officers and their families are not exactly exemplary in this respect).

Dysentery-Diarrhœa Group.—As usual this plays a very large part in the sickness of children. Laboratory diagnosis is difficult in these cases due to difficulties in obtaining appropriate specimens. The tendency then is to diagnose diarrhœa and not dysentery and to treat the condition lightly; whereas the majority of cases, especially in the fly season, are probably a dysenteric infection. The prevalence of the group during the fly season is specially noted from Shillong, Poona, Fategarh, Jullundur, Abbottabad, Lucknow, Almora and Roorkee.

It is difficult to get parents to bring their children in time for treatment. Dysentery and pneumonia are the two conditions for which children are too often brought up in a moribund state.

Enteric Group.—There are surprisingly few admissions for this group. This can only be attributed to T. A. B. inoculation and to protected water supplies in cantonments. T. A. B. protection is given to a large number of women and children: in some stations 50 per cent are protected, in others almost 100 per cent is claimed.

Tuberculosis.—The toll of this condition continues and nearly all the larger stations record 2 or 4 cases of the pulmonary type proved by laboratory findings. Unfortunately little can be done for them. They are a danger and cannot be kept in the lines, few will consent to go to Sanatorium treatment even if it could be obtained; and so perforce they have to be sent away to their homes where they must be a serious menace in the village life.

This is an aspect of family welfare which needs future attention. Of the non-pulmonary type cases of successful treatment by operation and spinal plaster jacket are recorded from several stations.

Eye diseases.—These bulk very largely in the treatment of families. Dust smoke in their quarters and close contact with infected cases are given as the reasons.

In the north, particularly in the Delhi-Jullundur-Jhelum area and including Chaklala, Trachoma has been very prevalent. The type is mild, but the infective qualities are there and spread of the infection throughout the whole family is noted.

In the south, eye diseases are not so common but conjunctivities is prevalent in the monsoon period and was also noted at this time in the U. P., particularly at Lucknow where 375 cases were treated.

At Abbottabad 1,161 cases of eye diseases were treated. The majority were in September and October which were dusty. The numbers were enhanced, chiefly amongst Gurkha families, by an epidemic of Koch-Weekes infection.

Ear diseases.—There was no high incidence of these except that at Fatehgarh bathing in the Ganges is given as a cause of marked prevalence of Otitis. The water is stated to be very dirty.

Respiratory diseases.—There were no epidemics recorded and as a whole these diseases were not of importance. Pneumonia took its toll sometimes combined with intestinal or other infection, and a number of deaths are recorded from this.

Infectious diseases.—There were no marked epidemics except that *measles*, 160 cases, was very prevalent in Shillong throughout the middle of the year. *Mumps* was recorded from other Gurkha stations. *Cerebrospinal fever* was not in evidence except for 5 cases at Shillong.

Scabies and *impetigo* were noted as being very prevalent in certain stations.

TABLE

Statement showing work done in Army Child

Commands.	Malaria.	Dysentery.	Enteric fevers.	Enteritis and Diarrhœa.	Other Digestive Diseases.
Northern.					
Admissions—					
Women	129	25	5	46	122
Children	102	28	29	259	82
Out-patients—					
Women	1,474	407	53	1,377	6,543
Children	1,974	638	108	4,929	8,174
Deaths—					
Women	2	...	...	...	...
Children	4	3	7	28	4
Eastern.					
Admissions—					
Women	135	55	5	27	125
Children	120	69	15	241	137
Out-patients—					
Women	850	238	7	539	2,744
Children	1,359	495	12	2,683	3,693
Deaths—					
Women	...	1	...	...	1
Children	3	6	1	36	1
Southern.					
Admissions—					
Women	46	10	2	18	28
Children	23	8	3	5	15
Out-patients—					
Women	683	84	...	538	3,741
Children	953	112	6	1,765	4,207
Deaths—					
Women	6	2	...	...	2
Children	2	8	2	5	...
Western (I.) District.					
Admissions—					
Women	38	...	...	...	6
Children	22	...	...	20	5
Out-patients—					
Women	76	12	...	36	195
Children	178	24	4	257	234
Deaths—					
Women	...	...	...	...	...
Children	...	...	...	3	...
All-India.					
Admissions—					
Women	348	90	12	91	281
Children	267	105	47	525	239
Out-patients—					
Women	3,083	741	60	2,490	13,223
Children	4,464	1,269	130	9,634	16,308
Deaths—					
Women	8	3	...	...	3
Children	9	17	10	72	5

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Welfare Centres (Indian Troops) 1939.

Tuberculosis.	Pneumonia.	Other respiratory diseases.	Diseases of the eyes.	Parturition.	Effects of parturition.	Generative system.	Minor septic diseases.	Total all causes.
47	19	37	40	698	134	235	39	1,879
8	97	156	73	...	...	6	118	1,278
101	20	2,910	2,387	303	1,445	2,247	1,908	29,686
49	225	5,431	5,750	...	...	328	3,496	43,617
12	3	1	...	3	2	...	...	31
5	28	8	...	...	...	...	2	124
16	40	72	45	370	90	283	28	1,511
3	149	192	118	...	...	...	65	1,704
18	39	1,669	2,165	576	430	1,708	418	19,045
...	145	3,824	4,687	...	...	...	1,165	31,589
4	2	1	...	2	1	...	...	22
3	52	8	...	...	...	...	1	164
4	6	22	1	432	54	22	4	689
...	29	28	2	...	...	1	9	188
18	24	1,238	505	125	404	847	315	13,843
3	86	3,107	1,366	...	...	14	694	18,989
9	1	...	...	...	2	...	...	28
...	5	...	...	...	...	...	...	49
3	...	15	3	171	9	4	1	262
18	...	51	6	...	...	...	...	154
1	4	77	57	93	30	13	23	950
16	3	132	121	...	...	...	76	1,819
1	...	...	...	...	1	...	...	2
...	2	1	...	...	...	...	...	10
70	65	146	89	1,671	287	544	72	4,337
29	275	427	199	...	...	7	192	3,324
138	87	5,804	5,114	1,095	2,309	4,815	2,664	63,524
68	459	12,494	11,924	...	...	342	5,431	96,014
26	6	2	...	3	6	...	...	83
8	87	17	...	...	...	...	3	347

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560

ANNUAL REPORT

ON THE

HEALTH OF THE ARMY IN INDIA

FOR THE YEAR

1939

VOLUME II

PART II.

(Statistics)

Z.-18873/D. M. S. 5.
ARMY HEADQUARTERS, INDIA.
Medical Directorate
New Delhi

PUBLISHED BY THE MANAGER OF PUBLICATIONS, DELHI.
PRINTED BY THE MANAGER, GOVERNMENT OF INDIA PRESS, NEW DELHI,
1941.

Price Re. 1 As. 10 or 2s. 6d.

Part I of this volume, to which this forms an appendix, was sent to you on December, 13th, 1940.

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TABLE A

Stations by Commands and Independent Districts.

Stations.	*Height above M. S. level in feet.	Authority for height.	Points of reference.
Northern Command.			
Abbottabad	4,010	S. D.	Map.
Ambala	902	,,	S. B. M.
Amritsar	754	,,	,,
Bannu	1,250	,,	Map.
Barian Camp and Khyragali	7,133	I. B.	..
Campbellpore	1,180	S. D.	Map.
Cherat	4,546	,,	,,
Dagshai	6,087	,,	,,
Dalhousie Convalescent Depot	7,687	,,	,,
Dera Ismail Khan	568	,,	S. B. M.
Ferozepore	649	,,	,,
Gharial	6,811	S. G.	,,
Jhelum	762	S. D.	,,
Jullundur Cantonment	771	,,	B. M.
Jutogh	6,370	,,	Map.
Kalabagh and Baragali	7,963	,,	,,
Kalabagh and Mari Indus	682	,,	,,
Kasauli Convalescent Depot	6,050	,,	..
Kohat	1,725	,,	Map.
Khanspur and Ghora Dhaka	7,721	,,	,,
Kuldana	7,049	S. G.	,,
Lahore Cantonment and Fort	706	S. D.	S. B. M.
Landikotal	3,509	,,	Map.
Lockhart Fort	6,613	,,	,,
Manzai	1,650	,,	,,
Mir Ali	2,240	S. G.	V. G. L.
Multan	404	S. D.	S. B. M.
Murree Convalescent Depot	7,073	,,	Map.
Nowshera (Railway Station)	966	,,	B. M.
Peshawar	1,152	,,	S. B. M.
Rawalpindi	1,689	,,	,,
Razmak	6,556	,,	Map.
Risalpur	1,014	,,	B. M.
Sialkot	829	,,	,,
Solon	5,078	,,	,,
Thall	2,450	,,	Map.
Wana	4,530	S. G.	V. G. L.
Western (I) District.			
Hyderabad	96	S. D.	S. B. M.
Karachi (Holy Trinity Church)	28	,,	,,
Quetta	5,510	,,	,,

TABLE A—*contd.*

Stations.	*Height above M. S. level in feet.	Authority for height.	Points of reference.
Eastern Command.			
Agra (Fort)	525	S. D.	S. B. M.
Allahabad and Fort	314	,,	,,
Bareilly	563	,,	,,
Barrackpore	24	,,	,,
Benares	256	,,	,,
Cawnpore	407	,,	B. M.
Chakrata	6,885	,,	Map.
Dacca	20	M. D.	,,
Dehra Dun	2,232	S. D.	S. B. M.
Delhi	757	,,	,,
Dinapore	170	,,	Church.
Fort William	17	S. G.	..
Fyzabad	330	S. D.	S. B. M.
Jhansi	849	,,	,,
Landour Convalescent Depot	7,528	,,	..
Lebong	6,000	,,	..
Lucknow Kalubir's	383	,,	B. M.
Meerut	737	,,	S. B. M.
Muttra	560	,,	,,
Port Blair (Tindal Obsy.)	9	,,	B. M.
Ranikhet	5,980	,,	..
Roorkee	879	,,	S. B. M.
Southern Command.			
Ahmedabad	162	,,	,,
Ahmednagar	2,180	,,	Map.
Bangalore	3,002	,,	S. B. M.
Belgaum	2,523	,,	,,
Colaba (Bombay Town Hall)	20	,,	,,
Deolali	1,894	,,	,,
Jubbulpore	1,320	,,	,,
Kamptee (Railway Station)	940	,,	B. M.
Madras (Obsy.)	250	,,	,,
Malapuram (Railway Station)	1,380	,,	,,
Mhow	1,887	,,	,,
Mount Abu Sanatorium	3,836	,,	,,
Nasirabad	1,461	,,	Map.
Pachmarhi	3,490	,,	,,
Poona	1,867	,,	S. B. M.
Saugor	1,755	,,	,,
Secunderabad	1,776	,,	,,
Wellington (Stn. Hospital)	5,800	,,	Map.

S. D.=Survey Department.
S. B. M.=Standard Bench Mark.
B. M.=G. T. Bench Mark.
S. G.=Surveyor-General of India.
M. D.=Meteorological Department.
V. G. L.=Village Ground level.
Map=Heights taken from Topo. Maps.
I. B.=Intelligence Branch of the Division of the Chief of the Staff.

*These heights are usually those of the survey-marks or of the mercury surface in barometer cisterns of meteorological observatories.

APPENDIX I.

BRITISH OTHER RANKS.
ALL INDIA.

I Prewar period (January to August).
II War Period (September to December).
III Whole Year.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick, during the year 1939.

Diseases.	Admissions.			Deaths.			Invalids.			Constantly sick.		
	I	II	III	I	II	III	I	II	III	I	II	III
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.												
Common cold	7·9	3·3	11·2	..	..	..	..	..	..	0·15	0·08	0·23
Diphtheria	1·1	0·8	1·9	..	..	..	..	..	..	0·13	0·10	0·23
Dysentery	21·2	7·8	28·9	0·03	..	0·03	0·06	..	0·06	0·93	0·39	1·32
Enteric fevers (inclusive of typhoid, Para. A, B and C and enteric group).	0·9	0·3	1·1	0·06	0·03	0·08	..	..	..	0·11	0·05	0·16
Erysipelas	0·0	..	0·0	..	..	..	..	..	..	0·00	..	0·00
Influenza	5·8	3·6	9·4	..	..	..	..	..	..	0·16	0·12	0·28
Malaria	26·9	28·2	55·1	0·08	0·03	0·11	..	..	..	1·08	1·16	2·25
Measles	0·6	0·1	0·7	..	..	..	..	..	..	0·02	0·00	0·02
Meningococcal infection	0·0	0·1	0·1	..	0·03	0·03	..	..	..	0·00	0·01	0·01
Mumps	0·3	0·1	0·4	..	..	..	..	..	..	0·02	0·00	0·02
Pneumonia	3·0	1·6	4·6	0·11	..	0·11	..	..	..	0·26	0·11	0·36
Pyrexia of uncertain origin	0·2	..	0·2	..	..	..	..	..	..	0·01	0·00	0·02
Rheumatic fever	1·0	0·5	1·5	..	..	..	0·11	..	0·11	0·14	0·04	0·17
Sandfly fever	21·4	9·3	30·7	..	..	..	..	..	..	0·42	0·19	0·62
Scarlet fever	..	..	..	..	..	..	..	..	..	..	..	..
Small-pox	0·1	0·0	0·1	..	..	..	..	..	..	0·01	0·00	0·01
Tuberculosis — Pulmonary	0·8	0·4	1·1	0·03	0·06	0·08	0·67	0·19	0·86	0·11	0·06	0·18
Tuberculosis — Other	0·2	0·0	0·2	0·03	..	0·03	0·06	..	·06	0·03	0·00	0·03
Venereal Diseases — Gonorrhoea	20·4	11·9	32·4	..	..	..	..	..	..	1·62	0·68	2·30
Venereal Diseases — Soft chancre	5·3	3·7	9·0	..	..	..	..	..	..	0·41	0·25	0·66
Venereal Diseases — Syphilis	5·0	3·4	8·5	..	..	..	..	..	..	0·44	0·23	0·67
Venereal Diseases — Other V. D.	0·8	1·0	1·8	..	..	..	..	..	..	0·04	0·08	0·1

Diseases.	Admissions.			Deaths.			Invalids.			Constantly sick.		
	I	II	III	I	II	III	I	II	III	I	II	III
Other diseases due to infection	11·9	4·4	16·4	0·19	0·03	0·22	0·06	0·06	0·11	0·45	0·19	0·65
Diseases due to infestation by metazoan parasites — Scabies	1·3	0·9	2·2	..	..	..	..	..	..	0·05	0·05	0·09
Diseases due to infestation by metazoan parasites — Other diseases	2·0	1·0	3·0	..	..	..	..	..	..	0·06	0·02	0·08
Other Diseases Classified under Systems.												
Diseases of the nervous system	7·5	2·4	10·0	0·08	..	0·08	0·69	0·11	0·81	0·38	0·13	0·51
Mental diseases	2·2	0·6	2·8	..	..	..	1·05	0·31	1·36	0·29	0·13	0·42
Diseases of the :—												
Eye	3·2	1·5	4·6	..	..	..	0·17	0·03	0·19	0·18	0·08	0·26
Ear and nose	19·6	8·8	28·4	..	..	..	0·14	0·06	0·19	0·60	0·30	0·90
Circulatory system — Valvular disease of the heart.	0·3	0·1	0·4	..	..	..	0·22	..	0·22	0·03	0·01	0·04
Circulatory system — Disordered action of the heart.	2·2	0·6	2·7	..	..	..	0·14	..	0·14	0·12	0·04	0·16
Circulatory system — Other diseases	1·2	0·7	1·9	0·08	0·08	0·17	0·22	..	0·22	0·10	0·04	0·14
Blood and blood forming organs	4·7	2·3	7·0	..	..	..	0·06	..	0·06	0·31	0·14	0·45
Ductless or endocrine glands	0·2	0·1	0·2	..	..	..	0·06	..	0·06	0·01	0·00	0·02
Breast	0·1	..	0·1	..	..	..	..	..	..	0·00	..	0·00
Respiratory system — Larynx and trachea.	1·3	1·0	2·3	..	..	..	..	..	..	0·03	0·02	0·05
Respiratory system — Bronchi and bronchioles.	13·2	6·3	19·4	..	..	..	0·22	..	0·22	0·47	0·24	0·70
Respiratory system — Other diseases	1·6	0·6	2·2	0·03	0·03	0·06	0·14	0·08	0·22	0·13	0·07	0·20
Teeth and gums	2·0	0·7	2·7	..	..	..	..	..	..	0·06	0·02	0·07
Digestive system — Inflammation of tonsils.	23·1	11·6	34·6	..	..	..	..	..	..	0·54	0·32	0·86
Digestive system — Inflammation of pharynx.	10·8	4·0	14·7	..	..	..	..	..	..	0·22	0·09	0·31
Digestive system — Inflammation of stomach.	4·9	2·1	7·0	..	..	..	..	..	..	0·14	0·06	0·20
Digestive system — Gastric ulcer	0·5	0·2	0·7	0·03	..	0·03	0·03	..	0·03	0·06	0·02	0·08

	Duodenal ulcer	0·3	0·1	0·4	..	..	..	0·03	..	0·03	0·03	0·01	0·04
	Liver . .	2·8	1·6	4·4	0·03	0·03	0·06	..	0·03	0·03	0·16	0·09	0·25
	Other diseases	46·9	18·3	65·2	0·25	0·03	0·28	0·28	0·08	0·36	1·62	0·74	2·35
Diseases due to disorders of nutrition or of metabolism.		0·2	..	0·2	..	..	..	0·08	..	0·08	0·03	..	0·03
Diseases of the :—													
Generative system . .		12·4	4·9	17·2	..	..	..	0·03	..	0·03	0·55	0·21	0·75
Bones, joints, muscles, fasciae and bursae.		18·9	7·9	26·8	..	..	..	0·58	..	0·58	0·89	0·40	1·29
Areolar tissues . . .		39·6	21·0	60·6	..	0·03	0·03	0·03	..	0·03	1·21	0·72	1·93
Skin		27·2	14·1	41·3	..	..	..	0·03	0·06	0·08	1·16	0·59	1·75
Urinary organs . . .		5·1	2·4	7·5	..	0·03	0·03	0·11	0·03	0·14	0·30	0·14	0·44
Injuries	General .	2·7	0·7	3·4	0·25	0·11	0·36	..	..	..	0·09	0·02	0·11
	Local . .	43·0	21·9	64·9	0·17	0·14	0·31	0·47	0·06	0·53	1·72	0·83	2·55
	In action .	0·8	0·5	1·3	0·33	0·11	0·44	..	0·03	0·03	0·05	0·06	0·11
Tumours and cysts . . .		2·0	0·9	2·9	0·03	..	0·03	0·22	..	0·22	0·10	0·05	0·15
Poisons		0·2	0·1	0·3	0·03	..	0·03	..	..	..	0·01	0·00	0·01
No appreciable disease . .		1·8	2·5	4·4	..	..	..	..	..	..	0·07	0·07	0·14
Suicides*		0·0	..	0·0	0·06	0·11	0·17	..	..	..	0·00	..	0·00
	TOTAL .	440·8	223·0	663·9	1·83	0·75	2·58	5·95	1·11	7·06	18·28	9·46	27·74

*The figures against " Suicide " having already been shown under the heading of the injury, etc. which caused death, are not included in the total.

APPENDIX II.

BRITISH OTHER RANKS.
NORTHERN COMMAND.

I Prewar period (January to August).
II War period (September to December).
III Whole year.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick during the year 1939.

Diseases.	Admissions:			Deaths.			Constantly sick.		
	I	II	III	I	II	III	I	II	III
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.									
Common cold	4·5	1·7	6·1	..	..	..	0·07	0·04	0·11
Diphtheria	0·4	0·6	1·0	..	..	..	0·03	0·07	0·10
Dysentery	12·1	6·8	18·9	0·08	0·08	0·16	0·50	0·27	0·77
Enteric fevers (inclusive of typhoid, Paras. A. B. and C. and enteric group)	1·1	0·4	1·5	..	0·08	0·08	0·12	0·08	0·20
Erysipelas	0·1	..	0·1	..	..	..	0·00	..	0·00
Influenza	7·5	2·1	9·6	..	..	..	0·18	0·05	0·23
Malaria	27·6	39·7	67·4	0·08	..	0·08	0·80	1·34	2·14
Measles	1·3	0·1	1·4	..	..	..	0·03	0·00	0·03
Meningococcal infection	0·1	..	0·1	..	..	..	0·01	..	0·01
Mumps	0·3	..	0·3	..	..	..	0·02	..	0·02
Pneumonia	4·4	2·3	6·7	0·16	..	0·16	0·38	0·14	0·52
Pyrexia of uncertain origin	0·2	..	0·2	..	..	..	0·01	0·00	0·01
Rheumatic fever	0·8	0·6	1·4	..	..	..	0·16	0·03	0·20
Sandfly fever	38·6	13·8	52·4	..	..	..	0·74	0·27	1·01
Scarlet fever	..	..	..	..	..	..	..	..	..
Small-pox	0·1	..	0·1	..	..	..	0·01	..	0·01
Tuberculosis — Pulmonary	0·3	0·3	0·6	..	..	..	0·05	0·04	0·09
Tuberculosis — Other	0·5	..	0·5	0·08	..	0·08	0·05	0·00	0·06
Venereal Diseases — Gonorrhoea	15·0	11·4	26·4	..	..	..	1·34	0·66	2·00
Venereal Diseases — Soft chancre	2·5	1·5	4·1	..	..	..	0·24	0·13	0·37
Venereal Diseases — Syphilis	2·5	3·2	5·7	0·08	..	0·08	0·22	0·25	0·47
Venereal Diseases — Other V. D.	0·6	0·2	0·8	..	..	..	0·03	0·02	0·05
Other diseases due to infection	4·4	2·3	6·7	0·24	..	0·24	0·23	0·14	0·37
Diseases due to infestation by metazoan parasites — Scabies	0·9	0·5	1·4	..	..	..	0·03	0·04	0·07
Diseases due to infestation by metazoan parasites — Other diseases	2·2	1·2	3·4	..	..	..	0·05	0·03	0·08

OTHER DISEASES CLASSIFIED UNDER SYSTEMS.									
Diseases of the nervous system	9·9	3·0	12·9	0·08	..	0·08	0·32	0·14	0·46
Mental diseases	1·7	0·5	2·1	..	..	..	0·26	0·19	0·45
Diseases of the :—									
Eye	2·1	1·0	3·1	..	..	..	0·16	0·05	0·22
Ear and nose	20·5	9·8	30·3	..	..	..	0·62	0·32	0·95
Circulatory system — Valvular disease of the heart	0·2	0·2	0·5	..	..	..	0·02	0·03	0·05
Circulatory system — Disordered action of the heart	1·3	0·6	1·8	0·08	..	0·08	0·08	0·05	0·13
Circulatory system — Other diseases	1·0	0·8	1·8	..	0·08	0·08	0·07	0·03	0·10
Blood and blood forming organs	3·3	1·9	5·2	..	..	..	0·20	0·12	0·32
Ductless or endocrine glands	0·2	..	0·2	..	..	..	0·03	..	0·03
Breast	..	..	..	..	..	..	..	..	..
Respiratory system — Larynx and trachea	1·4	1·8	3·2	..	..	..	0·04	0·03	0·07
Respiratory system — Bronchi and bronchioles	16·0	8·9	24·9	..	..	..	0·57	0·30	0·87
Respiratory system — Other diseases	1·6	0·6	2·2	..	0·08	0·08	0·15	0·10	0·25
Teeth and gums	1·5	0·9	2·4	..	..	..	0·03	0·02	0·06
Digestive system — Inflammation of the tonsils	18·4	13·5	31·9	..	..	..	0·43	0·35	0·78
Digestive system — Inflammation of the pharynx	12·4	5·0	17·4	..	..	..	0·23	0·11	0·34
Digestive system — Inflammation of stomach	5·8	2·9	8·8	..	..	..	0·18	0·10	0·28
Digestive system — Gastric Ulcer	0·7	0·2	1·0	0·08	..	0·08	0·08	0·03	0·11
Digestive system — Duodenal ulcer	0·6	0·2	0·7	..	..	..	0·06	0·01	0·07
Digestive system — Liver	1·4	2·5	3·9	..	..	..	0·06	0·09	0·16
Digestive system — Other diseases	41·2	23·1	64·3	0·24	..	0·24	1·53	0·82	2·35
Diseases due to disorders of nutrition or of metabolism	0·2	..	0·2	..	..	..	0·02	..	0·02
Diseases of the :—									
Generative system	11·1	5·0	16·1	..	..	..	0·43	0·17	0·60
Bones, joints, muscles, fasciae and bursae	22·6	10·6	33·2	..	..	..	1·11	0·53	1·64
Areolar tissues	36·4	23·8	60·2	..	..	..	1·18	0·79	1·97
Skin	22·5	13·9	36·5	..	..	..	1·05	0·61	1·66
Urinary Organs	3·8	2·1	6·0	..	..	..	0·23	0·15	0·38
Injuries — General	3·7	1·4	5·2	0·32	0·08	0·40	0·10	0·03	0·14
Injuries — Local	45·0	23·4	68·4	0·24	0·16	0·40	1·81	0·86	2·67
Injuries — In action	1·5	1·4	2·9	0·80	0·32	1·11	0·08	0·17	0·25
Tumours and cysts	1·5	0·6	2·1	..	..	..	0·05	0·04	0·09
Poisons	0·2	..	0·2	..	..	..	0·00	..	0·00
No appreciable disease	1·2	1·1	2·3	..	..	..	0·04	0·04	0·08
Suicides*	..	..	..	0·08	0·08	0·16	0·01	..	0·01
Total	418·7	249·8	668·5	2·63	0·88	3·50	16·57	9·91	26·48

* The figures against "Suicide" having already been shown under the heading of the injury, etc., which caused death are not included in the total.

APPENDIX III.

BRITISH OTHER RANKS.
WESTERN (I.) DISTRICT.

I Pre-war period (January to August).
II War period (September to December).
III Whole year.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick, during the year 1939.

Diseases.	Admissions.			Deaths.			Constantly sick.		
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.	I	II	III	I	II	III	I	II	III
Common cold	18·7	1·8	20·6	..	..	..	0·42	0·05	0·47
Diphtheria	..	..	..	..	..	..	..	..	..
Dysentery	19·2	2·3	21·5	..	..	..	1·32	0·14	1·46
Enteric fevers (inclusive of typhoid, para. A, B and C and enteric group)	0·5	..	0·5	..	..	..	0·05	..	0·05
Erysipelas	..	..	..	..	..	..	0·01	...	0·01
Influenza	..	6·0	6·0	..	..	..	..	0·49	0·49
Malaria	51·8	17·4	69·2	0·46	0·46	0·92	2·07	1·22	3·29
Measles	..	..	..	..	..	..	..	..	..
Meningococcal infection	..	..	..	..	..	..	..	..	..
Mumps	0·5	..	0·5	..	..	..	0·01	..	0·01
Pneumonia	0·9	1·8	2·7	..	..	..	0·04	0·17	0·21
Pyrexia of uncertain origin	0·9	..	0·9	..	..	..	0·05	..	0·05
Rheumatic fever	..	1·4	1·4	..	..	..	..	0·24	0·24
Sandfly fever	27·5	5·0	32·5	..	..	..	0·60	0·20	0·80
Scarlet fever	..	..	..	..	..	..	..	..	..
Smallpox	..	..	..	..	..	..	..	..	..
Tuberculosis — Pulmonary	2·3	0·9	3·2	0·46	0·92	1·37	0·32	0·02	0·34
Tuberculosis — Other	..	..	..	..	..	..	..	..	..
Venereal diseases — Gonorrhoea	24·3	8·2	32·5	..	..	..	1·65	0·28	1·92
Venereal diseases — Soft chancre	15·6	0·9	16·5	..	..	..	1·24	0·05	1·29
Venereal diseases — Syphilis	5·0	1·8	6·9	..	..	..	0·50	0·06	0·56
Venereal diseases — Other V. D.	5·0	0·5	5·5	..	..	..	0·11	0·05	0·16
Other diseases due to infection	1·4	0·9	2·3	..	..	..	0·05	0·04	0·09
Diseases due to infestation by metazoan parasites — Scabies	2·3	..	2·3	..	..	..	0·08	..	0·08
Diseases due to infestation by metazoan parasites — Other diseases	3·7	..	3·7	..	..	..	0·05	..	0·05

Other diseases classified under systems.

Diseases of the nervous system	4·1	3·7	7·8	..	..	..	0·11	0·23	0·34
Mental diseases	3·2	2·3	5·5	..	..	..	0·44	0·18	0·62
Diseases of the—									
Eye	5·5	1·8	7·3	..	..	..	0·44	0·19	0·64
Ear and nose	23·4	12·8	36·2	..	..	..	0·66	0·67	1·34
Circulatory system — Valvular disease of the heart	..	..	..	..	..	..	..	..	..
Circulatory system — Disordered action of the heart	4·6	0·9	5·5	..	..	..	0·12	0·16	0·27
Circulatory system — Other diseases	4·6	0·5	5·1	0·46	..	0·46	0·19	0·01	0·20
Blood and blood forming organs	6·4	..	6·4	..	..	..	0·65	0·01	0·66
Ductless or endocrine glands	..	..	..	..	..	..	..	..	..
Breast	1·4	..	1·4	..	..	..	0·03	..	0·03
Respiratory system — Larynx and trachea	7·8	2·7	10·5	..	..	..	0·13	0·06	0·20
Respiratory system — Bronchi and bronchioles	14·2	5·0	19·2	..	..	..	0·54	0·20	0·73
Respiratory system — Other diseases	1·8	1·4	3·2	..	..	..	0·17	0·11	0·28
Teeth and gums	1·8	0·5	2·3	..	..	..	0·04	0·00	0·04
Digestive system — Inflammation of tonsils	20·2	8·7	28·9	..	..	..	0·51	0·24	0·75
Digestive system — Inflammation of pharynx	5·5	2·7	8·2	..	..	..	0·11	0·07	0·18
Digestive system — Inflammation of stomach	3·2	2·3	5·5	..	..	..	0·06	0·04	0·11
Digestive system — Gastric ulcer	0·5	..	0·5	..	..	..	0·05	..	0·05
Digestive system — Duodenal ulcer	0·5	0·9	1·4	..	..	..	0·01	0·13	0·14
Digestive system — Liver	4·6	..	4·6	0·46	..	0·46	0·25	..	0·25
Digestive system — Other diseases	69·7	15·5	85·2	..	..	..	2·07	0·75	2·82
Diseases due to disorders of nutrition or of metabolism	0·5	..	0·5	..	..	..	0·03	..	0·03
Diseases of the—									
Generative system	17·0	5·5	22·5	..	..	..	0·64	0·31	0·95
Bones, joints, muscles, fasciae and bursae	19·7	6·0	25·7	..	..	..	0·68	0·29	0·97
Areolar tissues	27·0	12·4	39·4	..	..	..	0·72	0·49	1·21
Skin	36·7	13·3	50·0	..	..	..	1·92	0·55	2·47
Urinary organs	9·6	2·3	11·9	..	0·46	0·46	0·72	0·18	0·90
Injuries — General	3·7	0·9	4·6	..	..	..	0·08	0·06	0·14
Injuries — Local	39·4	17·0	56·4	..	..	..	1·20	0·70	1·90
Injuries — In action	..	..	..	..	..	..	..	..	..
Tumours and cysts	2·3	0·5	2·7	..	..	..	0·08	0·01	0·09
Poisons	..	..	..	0·46	..	0·46	..	..	..
No appreciable disease	4·1	1·4	5·5	..	..	..	0·18	0·04	0·22
Suicides	..	..	..	..	..	..	..	..	..
Total	522·5	170·0	692·5	2·29	1·83	4·12	21·43	8·68	30·11

APPENDIX IV.

BRITISH OTHER RANKS.
EASTERN COMMAND.

I Pre-war period (January to August).
II War period (September to December).
III Whole year.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick, during the year 1939.

Diseases.	Admissions.			Deaths.			Constantly Sick.		
	I	II	III	I	II	III	I	II	III
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.									
Common cold	10·7	6·9	17·5	..	..	..	0·21	0·18	0·29
Diphtheria	1·6	0·9	2·5	..	..	..	0·20	0·13	0·34
Dysentery	27·3	9·9	37·2	..	..	..	1·31	0·64	1·96
Enteric fevers (inclusive of typhoid, Para. A. B. and C and enteric group).	0·6	0·4	0·9	0·09	..	0·09	0·10	0·07	0·17
Erysipelas	..	..	..	..	..	..	..	..	..
Influenza	5·9	2·1	8·1	..	..	..	0·20	0·07	0·26
Malaria	16·0	15·8	31·8	..	..	..	0·77	0·89	1·66
Measles	0·03	0·1	0·4	..	..	..	0·01	0·01	0·01
Meningococcal infection	..	0·1	0·1	..	0·09	0·09	..	0·00	0·00
Mumps	0·2	0·1	0·3	..	..	..	0·00	0·00	0·01
Pneumonia	2·7	1·1	3·8	0·19	..	0·19	0·22	0·07	0·29
Pyrexia of uncertain origin	..	..	..	..	..	..	..	..	..
Rheumatic fever	0·7	0·4	1·1	..	..	..	0·10	0·02	0·12
Sandfly fever	18·7	12·9	31·6	..	..	..	0·39	0·26	0·65
Scarlet fever	..	..	..	..	..	..	..	..	..
Small-pox	0·2	0·1	0·3	..	..	..	0·02	0·01	0·03
Tuberculosis — Pulmonary	0·9	0·3	1·2	..	..	..	0·12	0·07	0·19
Tuberculosis — Other	..	..	..	..	..	..	..	..	..
Venereal Diseases — Gonorrhoea	24·1	10·5	34·6	..	..	..	1·88	0·59	2·47
Venereal Diseases — Soft Chancre	3·8	5·3	9·1	..	..	..	0·27	0·35	0·62
Venereal Diseases — Syphilis	5·7	2·7	8·3	..	..	..	0·50	0·21	0·71
Venereal Diseases — Other V. D.	0·6	1·5	2·1	..	..	..	0·04	0·12	0·17
Other diseases due to infection	26·0	8·3	34·4	0·37	..	0·37	0·81	0·30	1·11
Diseases due to infestation by metazoan parasites — Scabies	1·5	0·9	2·4	..	..	..	0·06	0·06	0·12
Diseases due to infestation by metazoan parasites — Other diseases	1·5	0·8	2·3	..	..	..	0·05	0·03	0·08

Other Diseases Classified under systems.										
Diseases of the nervous system	6·8	2·7	9·5	0·19	..	0·19	0·40	0·13	0·53
Mental diseases	2·6	0·6	3·2	..	..	..	0·22	0·03	0·25
Diseases of the :—									
Eye	4·7	2·0	6·8	..	..	..	0·20	0·09	0·29
Ear and nose	19·3	8·0	27·2	..	..	..	0·55	0·22	0·77
Circulatory system — Valvular disease of the heart	0·3	0·1	0·4	..	..	..	0·02	0·01	0·03
Circulatory system — Disordered action of the heart	3·6	0·7	4·4	..	..	..	0·19	0·03	0·22
Circulatory system — Other diseases	0·6	0·6	1·2	..	0·09	0·09	0·08	0·03	0·11
Blood and blood forming organs	4·9	3·2	8·2	..	..	..	0·26	0·19	0·45
Ductless or endocrine glands	0·1	0·1	0·2	..	..	..	0·00	0·00	0·01
Breast	..	..	..	..	..	..	..	..	..
Respiratory system — Larynx and trachea	0·9	0·6	1·5	..	..	..	0·03	0·01	0·04
Respiratory system — Bronchi and bronchioles	12·0	4·5	16·5	..	..	..	0·36	0·15	0·51
Respiratory system — Other diseases	1·9	0·6	2·5	0·09	..	0·09	0·12	0·07	0·19
Teeth and gums	2·4	0·5	2·9	..	..	..	0·06	0·01	0·07
Digestive system — Inflammation of tonsils	23·9	11·7	35·6	..	..	..	0·64	0·32	0·96
Digestive system — Inflammation of pharynx	13·9	1·8	15·7	..	..	..	0·27	0·03	0·30
Digestive system — Inflammation of stomach	6·1	1·5	7·6	..	..	..	0·17	0·04	0·21
Digestive system — Gastric ulcer	0·6	0·3	0·8	..	..	..	0·05	0·02	0·08
Digestive system — Duodenal ulcer	0·1	0·1	0·2	..	..	..	0·02	0·01	0·03
Digestive system — Liver	5·2	1·2	6·4	0·09	..	0·09	0·30	0·09	0·39
Digestive system — Other diseases	59·7	17·4	77·1	0·28	0·09	0·37	1·85	0·80	2·65
Diseases due to disorders of nutrition or of metabolism	0·3	..	0·3	..	..	..	0·05	..	0·05
Diseases of the :—									
Generative system	12·2	5·2	17·4	..	..	..	0·59	0·27	0·86
Bones, joints, muscles, fasciae and bursae	20·7	8·5	29·2	..	..	..	0·94	0·43	1·37
Areolar tissues	43·6	23·4	67·0	..	0·09	0·09	1·29	0·86	2·15
Skin	33·5	17·1	50·7	..	..	..	1·25	0·66	1·91
Urinary organs	4·8	1·9	6·8	..	..	..	0·29	0·10	0·39
Injuries — General	2·9	0·1	3·0	0·28	..	0·28	0·10	0·00	0·10
Injuries — Local	48·4	21·3	69·7	0·28	0·09	0·37	2·00	0·79	2·79
Injuries — In action	..	..	..	..	..	..	..	..	..
Tumours and cysts	2·3	1·1	3·4	0·09	..	0·09	0·10	0·06	0·16
Poisons	0·3	0·1	0·4	..	..	..	0·00	0·00	0·01
No appreciable disease	2·0	6·3	8·3	..	..	..	0·09	0·17	0·26
Suicides*	0·1	..	0·1	0·09	0·09	0·19	0·00	..	0·00
Total	489·5	224·1	713·7	1·95	0·46	2·41	19·77	9·74	29·51

*The figures against "Suicides" having already been shown under the heading of the injury, etc. which caused death, are not included in the total.

APPENDIX V.

BRITISH OTHER RANKS.
SOUTHERN COMMAND.

I. Pre war period (January to August).
II. War period (September to December).
III. Whole Year.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick, during the year 1939.

Diseases.	Admissions.			Deaths.			Constantly sick.		
	I	II	III	I	II	III	I	II	III
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.									
Common cold	7·0	2·0	9·0	..	..	..	0·12	0·03	0·15
Diphtheria	1·8	1·0	2·8	..	..	..	0·18	0·13	0·31
Dysentery	26·2	7·7	33·9	..	..	..	0·98	0·32	1·30
Enteric Fevers (inclusive of typhoid, para. A, B and C and enteric group).	0·9	0·1	1·0	..	..	..	0·13	0·01	0·14
Erysipelas	..	..	..	..	..	..	..	..	..
Influenza	4·8	6·4	11·2	..	..	..	0·12	0·18	0·30
Malaria	32·0	29·5	61·6	0·10	..	0·10	1·54	1·21	2·75
Measles	0·3	..	0·3	..	..	..	0·01	..	0·01
Meningococcal infection	..	0·1	0·1	..	..	..	..	0·01	0·01
Mumps	0·4	0·1	0·5	..	..	..	0·03	0·00	0·03
Pneumonia	2·2	1·1	3·3	..	..	..	0·19	0·10	0·29
Pyrexia of uncertain origin	0·2	..	0·2	..	..	..	0·03	..	0·03
Rheumatic fever	1·7	0·4	2·1	..	..	..	0·17	0·02	0·19
Sandfly fever	2·4	1·0	3·4	..	..	..	0·04	0·03	0·07
Scarlet fever	..	..	..	..	..	..	..	..	..
Small-pox	..	..	..	..	..	..	..	..	..
Tuberculosis — Pulmonary	0·8	0·4	1·2	..	..	..	0·15	0·09	0·24
Tuberculosis — Other	0·1	0·1	0·2	..	..	..	0·02	0·00	0·02
Vénereal diseases — Gonorrhoea	22·5	14·8	37·3	..	..	..	1·68	0·89	2·57
Vénereal diseases — Soft chancre	8·0	5·4	13·4	..	..	..	0·57	0·35	0·92
Vénereal diseases — Syphilis	7·5	4·9	12·3	..	..	..	0·63	0·28	0·91
Vénereal diseases — Other V. D.	0·1	1·5	1·6	..	..	..	0·00	0·10	0·10
Other diseases due to infection	9·2	3·6	12·8	..	..	..	0·45	0·17	0·62
Diseases due to infestation by matazoan parasites. — Scabies	1·5	1·5	3·1	..	..	..	0·04	0·06	0·10
Diseases due to infestation by matazoan parasites. — Other diseases.	2·1	1·0	3·1	..	..	..	0·08	0·03	0·11

OTHER DISEASES CLASSIFIED UNDER SYSTEM.									
Diseases of the nervous system	6·2	1·2	7·5	..	..	..	0·47	0·09	0·56
Mental diseases	2·1	0·6	2·7	..	..	..	0·38	0·15	0·53
Diseases of the :—									
Eye	2·4	1·3	3·7	..	..	..	0·13	0·08	0·21
Ear and nose	17·9	7·7	25·6	..	..	..	0·62	0·26	0·88
Circulatory system. — *Valvular diseases of the heart*	0·5	..	0·5	..	..	..	0·05	0·00	0·05
Circulatory system. — Disordered action of the heart	1·5	0·4	1·9	..	..	..	0·09	0·02	0·11
Circulatory system. — Other diseases	1·4	0·6	2·0	0·10	0·10	0·19	0·15	0·03	0·18
Blood and blood forming organs	5·8	2·4	8·2	..	..	..	0·42	0·15	0·57
Ductless or endocrine glands	0·2	0·2	0·4	..	..	..	0·01	0·01	0·02
Breast	0·1	..	0·1	..	..	..	0·00	..	0·00
Respiratory system — Larynx and trachea	0·3	0·1	0·4	..	..	..	0·01	0·00	0·01
Respiratory system — Bronchi and bronchioles	10·8	5·1	15·9	..	..	..	0·44	0·25	0·69
Respiratory system — Other diseases	1·2	0·5	1·7	..	..	..	0·10	0·04	0·14
Teeth and gums	2·1	0·9	3·0	..	..	..	0·08	0·02	0·10
Digestive system — Inflammation of tonsils	28·5	9·7	38·2	..	..	..	0·58	0·29	0·87
Digestive system — Inflammation of pharnyx	6·7	4·3	11·0	..	..	..	0·18	0·12	0·30
Digestive system — Inflammation of stomach	2·8	1·7	4·5	..	..	..	0·08	0·04	0·12
Digestive system — Gastric ulcer	0·3	0·2	0·5	..	..	..	0·03	0·02	0·05
Digestive system — Duodenal ulcer	..	..	..	..	..	..	..	..	..
Digestive system — Liver	1·8	1·3	3·2	..	0·10	0·10	0·13	0·09	0·22
Digestive system — Other diseases	35·7	15·1	50·8	0·19	..	0·19	1·39	0·57	1·96
Diseases due to disorders of nutrition or of metabolism	0·1	..	0·1	..	..	..	0·01	..	0·01
Diseases of the :—									
Generative system	13·1	4·3	17·4	..	..	..	0·61	0·16	0·78
Bones, joints, muscles, fasciae and bursae	12·4	4·6	17·0	..	..	..	0·62	0·23	0·85
Areolar tissues	41·8	17·0	58·8	..	..	..	1·26	0·54	1·80
Skin	24·3	11·6	35·9	..	..	..	1·06	0·49	1·55
Urinary organs	6·1	3·2	9·3	..	..	..	0·30	0·16	0·46
Injuries — General	1·2	0·5	1·7	0·19	0·29	0·48	0·05	0·02	0·06
Injuries — Local	36·8	21·8	58·6	0·10	0·19	0·29	1·49	0·86	2·35
Injuries — In action	..	..	..	..	..	..	..	..	..
Tumours and cysts	2·3	1·0	3·3	..	..	..	0·15	0·07	0·22
Poisons	0·3	0·1	0·4	..	..	..	0·02	0·00	0·02
No appreciable diseases	1·8	0·6	2·4	..	..	..	0·07	0·01	0·08
Suicides*	..	..	..	..	0·19	0·19	..	..	..
Total	400·2	200·7	600·9	0·67	0·67	1·34	18·14	8·80	26·94

*The figures against "Suicides" having already been shown under the heading of the injury etc., which caused death are not included in the total.

APPENDIX VI.

BRITISH OTHER RANKS.

Table showing monthly ratios per 1,000 of strength of admissions for certain diseases for all-India during the year 1939.

Months.	Enteric group of fevers.	Influenza.	Cholera.	Small pox.	Malaria.	Dysentery protozoal.	Dysentery bacillary.	Dysentery bacillary unspecified.	Dysentery group.	Pyrexia of uncertain origin.	Pneumonia (lobar and lobular).	Diarrhœa.	Dengue.	Sandfly fever.	Plague.	Effects of heat.	All Causes.
January	0·03	1·6	..	0·03	1·4	0·1	0·5	0·2	0·3	..	0·3	1·5	0·6	0·1	..	..	46·4
February	0·1	1·0	..	..	1·0	0·2	1·3	0·1	0·4	..	0·4	0·8	0·2	0·1	..	..	38·0
March	0·1	0·8	..	..	1·4	0·2	1·1	0.2	0·7	..	0·2	1·1	0·3	0·5	..	..	44·2
April	0·1	0·7	..	..	1·5	0·2	1·9	0·3	0·8	..	0·2	2·1	0·5	0·8	..	..	45·4
May	0·2	0·4	..	0·1	2·0	0·2	1·8	0·2	0·4	0·1	0·3	2·3	2·1	2·8	..	0·2	56·3
June	0·1	0·4	..	..	4·5	0·3	1·2	0·4	0·1	0·03	0·3	1·8	1·1	5·0	..	0·5	58·1
July	0·1	0·3	..	..	8·2	0·3	2·2	0·4	0·7	0·03	0 3	1·8	0·7	7·3	..	0·5	69·3
August	0·1	0·2	..	..	6·8	0·3	2·8	0·4	0·6	0·03	0·3	2·7	1·6	4·6	..	0·3	71·7
September	0·2	1·1	..	..	9·1	0·3	1·9	0·4	0·5	..	0·3	1·1	1·2	4·1	..	0·2	69·8
October	0·03	1·4	..	..	9·9	0·2	1·3	0·1	0·5	..	0·4	1·3	0·3	3·5	..	0·1	67·1
November	0·03	0·4	..	..	9·0	0·2	1·3	0·2	0·3	..	0·3	1·5	0·5	2·2	..	..	59·4
December	..	0·9	..	0·03	2·6	..	0·6	0·3	0·1	..	0·7	0·9	0·2	0·1	..	..	43.5
Total	1·1	9·2	..	0·1	55·2	2·6	17·7	3·2	5·5	0·1	4·4	18·3	9·7	30·4	..	1·8	663·8

APPENDIX VII.

APPENDIX

BRITISH

Table showing ratios per 1,000 of strength of admissions for certain

Stations and districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para. A.	Para. B.	Para. C.	Enteric group.	Bacillary.	B. exudate.	Protozoal.	Clinical.
Cherat	..	..	..	..	..	20·8	..	13·9	..
Landikotal	..	..	1·7	..	..	6·9	..	..	1·7
Nowshera	..	..	..	..	..	..	2·6	..	1·3
Peshawar	1·8	..	..	..	0·9	15·0	0·9	0·9	0·9
Risalpur	1·8	..	..	..	..	1·8	..	..	1·8
Total Peshawar District	0·9	..	0·3	..	0·3	7·9	0·9	0·9	1·3
Fort Lockhart	..	..	..	..	..	..	..	..	..
Kohat	..	..	..	..	..	22·1		..	..
Thal	..	..	..	..	..	..	..	..	..
Total Kohat District	..	.	.	..	..	20·4	..	..	..
Abbottabad	..	..	..	..	..	9·9	..	..	..
Barian	..	..	..	..	..	..	8·3	..	..
Campbellpore	..	..	..	..	..	10·6	10·6	..	..
Gharial	7·8	..	..	..	..	3·9	..	..	..
Jhelum	..	..	..	..	..	..	..	..	..
Kalabagh	..	..	..	..	..	25·0	..	..	25·0
Khanspur	..	..	..	..	..	7·2	..	..	..
Kuldana	..	..	..	..	..	7·3	..	..	..
Murree	..	..	..	..	..	9·7	..	..	9·7
Rawalpindi	0·6	..	..	..	0·6	13·3	3·5	1·2	7·0
Total Rawalpindi District	1·1	..	..	..	0·4	11·0	2·8	0·7	5·0
Ambala	..	1·8	..	..	..	8·8	3·5	..	15·9
Amritsar	..	..	..	..	..	..	..	..	..
Dagshai	..	..	..	..	..	8·6	8·6	..	..
Dalhousie	..	..	..	..	..	6·4	3·2	..	3·2
Ferozepore	1·6	1·6	1·6	..	1·6	..	6·4	..	..
Jullundur	..	..	..	..	..	2·2	6·7	2·2	6·7
Jutogh	..	..	..	..	..	16·3	..	..	8·1
Kasauli	..	..	..	..	..	7·9	..	..	..
Lahore	..	1·2	..	..	1·2	2·5	4·9	7·4	4·9
Multan	..	..	..	..	2·2	..	4·4	..	..
Sialkot	..	..	..	..	3·5	20·8	1·7	3·5	..
Solon	..	..	..	..	..	..	..	..	..
Total Lahore District	0·2	0·7	0·2	..	1·1	6·1	4·2	2·0	3·9

VII.

OTHER RANKS.

diseases in each station and district in India for the year 1939.

Diarrhœa.	Cholera.	Venereal diseases.	Small-pox.	Malaria.	Dengue.	Sandfly fever.	Plague.	Influenza.	Pneumonia (lobar and lobular).	Heat stroke.	Heat exhaustion.	All causes.	Constantly sick.
20·8	..	13·9	..	34·7	..	6·9	..	..	6·9	..	..	708·3	20·56
6·9	..	22·5	..	12·1	..	107·1	..	12·1	5·2	..	5·2	556·1	18·03
32·8	..	27·6	..	48·6	..	94·5	..	3·9	21·0	..	6·6	727·0	23·41
19·5	..	21·2	..	28·3	..	130·9	..	18·6	5·3	2·7	2·7	748·9	29·92
18·0	..	9·0	..	46·7	..	23·3	..	..	..	..	..	470·4	10·00
20·2	..	20·5	..	33·7	..	93·3	..	9·8	8·2	0·9	3·5	657·7	22·26
..	..	..	..	...	..	..	..	..	..	..	..	..	..
22·1	..	5·5	..	232·0	..	71·3	..	16·6	11·0	..	5·5	823·2	28·43
..	..	..	..	..	..	..	..	..	..	..	..	222·2	1·11
20·4	..	5·1	..	214·3	..	66·3	..	15·3	10·2	..	5·1	770·4	21·68
9·9	..	44·6	..	..	..	5·0	..	5·0	5·0	..	..	495·0	12·43
8·3	..	50·0	..	41·7	..	66·7	..	..	8·3	..	..	516·7	56·17
10·6	..	42·5	..	21·3	..	..	..	..	42·5	..	..	334·0	7·34
3·9	..	..	..	35·0	..	11·7	..	..	3·9	..	..	385·2	7·74
..	..	..	..	100·0	..	..	..	..	..	..	..	100·0	3·00
50·0	..	50·0	..	25·0	..	50·0	..	..	..	..	..	650·9	16·50
..	..	..	..	21·6	..	..	..	..	7·2	..	..	100·7	2·09
..	..	36·5	..	21·9	..	21·9	..	..	..	..	..	328·5	5·62
..	..	..	..	48·5	19·4	68·0	..	..	..	..	..	1301·0	169·51
9·3	..	48·1	..	51·6	..	69·5	..	19·1	9·3	..	7·0	622·2	27·48
8·1	..	38·6	..	41·7	0·7	50·9	..	12·0	8·5	..	4·2	557·8	27·80
15·9	..	30·0	..	100·7	..	12·4	..	7·1	3·5	..	..	687·3	29·08
15·3	..	61·1	..	38·2	..	..	..	38·2	..	..	30·5	709·9	28·02
3·6	..	55·8	..	81·5	..	..	..	..	..	..	..	643·3	15·19
12·7	..	22·3	..	12·7	..	..	..	..	3·2	..	..	410·3	23·85
19·1	..	73·1	..	95·4	..	42·9	..	7·9	9·5	1·6	4·8	763·1	29·44
26·6	..	97·6	..	6·7	..	2·2	..	20·0	..	..	..	631·9	28·58
..	..	16·3	..	16·3	..	..	..	8·1	8·1	..	..	398·4	12·52
19·8	..	..	..	27·7	..	..	..	..	..	..	..	675·9	39·21
9·9	..	65·5	..	58·1	7·4	1·2	..	29·7	8·7	..	1·2	845·5	40·99
13·3	..	26·7	..	144·4	..	28·9	..	..	4·4	2·2	..	711·1	21·53
24·3	..	48·5	1·7	38·1	..	126·5	..	..	12·1	..	..	854·4	30·66
..	..	66·7	..	66·7	..	..	..	..	..	..	..	600·0	20·00
16·2	..	50·7	0·2	64·0	1·3	26·8	..	10·5	5·7	0·4	1·8	713 3	29·39

APPENDIX

Stations and districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para. A.	Para. B.	Para. C.	Enteric group.	Bacillary.	B. exudate.	Protozoal.	Clinical.
Bannu	..	..	..	..	..	12·9	..	12·9	32·3
Dera Ismail Khan	..	..	..	..	..	..	..	..	..
Kalabagh	..	..	..	..	..	250·0	..	..	..
Manzai	..	..	..	..	..	..	..	..	34 5
Mir Ali	..	..	..	..	..	14·8	4·9	..	9·9
Razmak	..	..	..	..	..	26·4	0·8	3·9	13·2
Wana	..	..	..	..	..	..	..	..	..
Total Waziristan District	..	..	..	..	..	22·2	1·1	3·9	13·9
Quetta	..	..	..	..	..	7·8	5·6	..	5·6
Hyderabad	..	..	..	..	3·2	3·2	3·2	..	28·5
Karachi	..	..	..	..	..	5·1	4·1	1·0	8·2
Total Western (I.) District	..	..	..	..	0·5	6·0	4·6	0·5	10·1
Bareilly	..	..	..	..	..	24·0	..	4·8	4·8
Chakrata	3·0	..	..	..	..	12·0	21·0	6·0	..
Dehra Dun	..	..	..	..	..	..	..	..	..
Jhansi	..	..	..	..	..	42·6	1·1	4·4	5·5
Landour	..	..	..	..	..	..	..	..	..
Meerut	2·1	0·7	..	..	..	42·0	4·2	1·4	3·5
Roorkee	..	..	..	..	..	..	..	..	..
Total Meerut District	1·2	0·3	..	..	..	34·5	4·1	3·2	3·8
Allahabad	..	..	..	..	..	22·3	1·6	1·6	12·7
Benares	..	..	..	..	..	16·3	8·1	16·3	16·3
Cawnpore	..	..	..	..	..	7·7	..	..	7·7
Fyzabad	..	..	..	..	..	21·2	3·5	10·6	3·5
Lucknow	0·8	..	..	..	0·8	19·9	3·1	7·7	10·7
Ranikhet	..	..	..	..	1·2	26·3	2·4	6·0	..
Total Lucknow District	0·3	..	..	..	0·5	19·6	2·4	5·5	7·8
Alipore	..	..	..	..	1·4	24·2	4·3	15·6	4·3
Barrackpore	..	..	..	..	..	18·7	2·3	11·7	4·7
Dinapore	..	..	..	..	..	11·2	4·5	..	15·7
Lebong	..	..	..	..	..	9·4	3·1	..	6·3
Dacca	..	..	..	..	..	..	..	..	..
Port Blair	..	..	..	..	..	..	..	..	..
Total P. & A. District	..	..	..	..	0·5	16·2	3·4	7·9	6·9
Agra	..	..	..	..	1·7	24·3	1·7	..	..
Delhi	..	..	..	..	..	10·3	3·9	..	1·3
Muttra	..	..	..	..	6·1	42·9	12·3	..	..
Total Delhi (I.) Bde. Area	..	..	..	..	1·3	19·1	3·9	..	0·7
Ahmednagar	..	..	..	..	3·3	21·4	9·9	4·9	..
Jubbulpore	..	1·2	..	..	1·2	28·0	..	..	2·3
Kamptee	..	..	..	..	..	..	24·4	..	24·4

VII—*contd.*

Diarrhœa.	Cholera.	Venereal diseases.	Small-Pox.	Malaria.	Dengue.	Sandfly fever.	Plague.	Influenza.	Pneumonia (lobar and lobular).	Heat stroke.	Heat exhaustion.	All causes.	Constantly sick.
12·9	..	77·4	..	103·2	..	109·7	..	..	..	..	12·9	864·5	41·87
..	..	52·6	..	228·1	..	..	..	..	..	..	..	403·5	13·51
..	..	..	..	750·0	..	..	..	..	..	..	..	2250·0	70·00
..	..	..	..	103·4	..	..	..	..	..	34·5	..	379·3	7·93
9·9	..	4·9	..	64·0	..	59·1	..	4·9	..	..	..	571·4	9·26
26·4	..	22·5	..	178·3	..	34·9	..	1·6	3·9	..	..	784·5	27·12
..	..	..	..	136·4	..	..	..	30·3	..	..	..	393·9	14·39
21·1	..	24·9	..	159·1	..	41·0	..	2·8	2·8	0·6	1·1	737·8	25·27
23·5	..	14·5	..	96·1	..	54·7	..	..	6·7	..	..	681·6	31·44
9·5	..	113·9	..	129·7	..	9·5	..	..	..	..	..	588·6	11·90
49·4	..	80·2	..	24·7	4·1	19·5	..	13·4	..	..	..	735·6	34·62
33·0	..	58·2	..	69·2	1·8	32·5	..	6·0	2·7	..	..	692·5	30·04
32·1	..	56·1	..	14·4	..	30·4	..	25·6	4·8	..	..	996·8	34·92
9·0	..	48·0	..	54·1	..	..	..	3·0	3·0	..	..	738·7	29·55
..	..	46·2	..	30·8	..	15·4	..	..	..	..	..	615·4	19·38
29·5	..	30·6	..	43·7	1·1	7·7	..	2·2	6·6	..	..	674·3	26·00
117·6	..	..	..	117·6	..	..	..	..	..	..	..	2235·3	68·24
47·0	..	56·8	0·7	67·3	..	11·2	..	15·4	0·7	..	0·7	776·5	33·01
..	..	..	..	85·7	..	..	..	..	..	..	..	400 0	7·43
34·8	..	47·7	0·3	49·8	0·3	12·6	..	12·0	3·2	..	0·3	786·0	30·80
68·5	..	35·0	..	23·9	..	38·2	..	11·1	3·2	1·6	4·8	740·4	25·49
122·0	..	32·5	..	48·8	..	97·6	..	..	8·1	..	..	1033·0	41·22
33·9	..	109·4	1·5	16·9	3·1	29·3	..	..	..	..	..	671·8	21·54
42·4	..	49·5	..	..	..	..	..	..	..	..	..	441·7	19·15
9·2	..	73·5	..	14·5	..	117·2	..	9·2	4·6	0·8	7·7	673·0	31·91
20·3	..	16·7	..	17·9	..	2·4	..	9·6	2·4	..	..	500·1	31·38
31·6	..	57·8	0·3	17·3	0·5	54·9	..	7·1	2·9	0·5	3·4	640·5	28·34
5·7	..	68·8	..	24·2	381·0	..	..	10·0	12·8	1·4	1·4	1094·1	43·92
..	..	88·8	..	30·4	9·3	..	..	..	2·3	..	..	500·0	30·28
8·9	..	26·8	..	15·7	24 6	13·4	..	11·2	..	4·5	2·2	740·5	24·45
6·3	..	28·3	..	15·7	18·9	..	..	..	..	..	..	342·8	11·16
..	..	..	..	..	..	..	..	..	..	..	..	166·6	0·00
..	..	..	..	49·6	..	..	..	8·3	..	..	..	281·0	10·66
4·9	..	53·1	..	23·6	142·2	3·0	..	6·4	4·9	1·5	1·0	723·1	29·51
15·6	..	60·8	..	33·0	..	140·6	..	6·9	6·9	..	..	902·8	33·06
19·3	..	52·8	1·3	45·1	..	..	..	..	3·9	..	..	604·4	26·86
24·5	..	55·2	..	12·3	..	..	..	..	6·1	..	..	656·4	30·49
18·4	..	56·0	0·7	36·9	..	53·3	..	2·6	5·3	..	..	721·5	29·53
3·3	..	24·7	..	97·0	..	1·6	..	4·9	..	..	..	472·0	12·24
10·5	..	83·9	..	163·2	..	16·8	..	..	15·2	..	..	744·8	32·97
..	..	97·6	..	146·3	..	..	..	..	..	..	..	585 4	14·39

APPENDIX

Stations and districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para. A.	Para. B.	Para. C.	Enteric group.	Bacillary.	B. exudate.	Protozoal.	Clinical.
Pachmarhi	...	...	...	...	...	...	...	...	...
Saugor	...	...	...	...	...	...	...	...	...
Secunderabad	0·6	...	...	...	...	22·2	...	2·8	11·9
Total Deccan District	0·3	0·3	...	...	0·9	22·7	2·1	2·4	7·2
Belgaum	...	...	...	...	...	...	...	...	...
Poona	...	...	...	...	1·6	40·4	2·2	1·6	3·2
Total Poona Bde. Area	...	...	...	..	1·6	38·9	2·1	1·6	3·1
Ahmedabad	...	...	...	...	...	...	21·6	...	...
Bombay	...	...	...	...	...	3·6	...	...	2·4
Deolali	...	...	...	...	...	3·5	...	3·5	...
Mhow	...	...	...	...	...	25·0	2·5	3·3	6·7
Mount Abu	...	...	...	...	...	...	...	...	21·7
Nasirabad	...	...	...	...	...	35·0	2·1	2·1	6·2
Total Bombay District	...	...	...	...	...	17·0	2·3	2·0	4·7
Bangalore	...	1·2	...	...	...	11·8	8·2	4·7	8·2
Madras	...	...	...	...	...	32·7	12·0	...	6·9
Malapuram	...	...	...	...	...	...	...	...	...
Wellington	...	...	...	...	...	14·1	6·3	1·6	1·6
Total Madras District	...	0·5	...	...	...	17·5	8·3	2·3	5·5
TOTAL ALL-INDIA	0·4	0·2	0·1	..	0·5	17·7	3·2	2·5	5·5

VII—*concld.*

Diarrhœa.	Cholera.	Venereal diseases.	Small-pox.	Malaria.	Dengue.	Sandfly fever.	Plague.	Influenza	Pneumonia (lobar and lobular).	Heat stroke.	Heat exhaustion.	All causes.	Constantly sick
...	...	...	...	153·8	...	...	...	...	...	...	...	250·0	3·46
...	...	...	...	37·0	...	...	...	...	...	...	...	444·4	3·70
17·6	...	75·6	...	14·8	0·6	...	...	...	2·3	...	...	626·1	29·14
12·5	...	66·9	...	71·7	0·3	4·5	...	0·9	5·1	...	...	620·2	26·24
...	...	14·5	...	14·5	...	...	...	29·0	...	...	...	202·9	4·20
4·8	...	77·5	...	78·6	...	...	...	5·9	1·1	...	...	701·7	36·78
4·7	...	75·3	...	76·3	...	...	..	6·7	1·0	...	...	683·8	35·61
...	...	57·6	...	208·6	...	14·4	...	...	14·4	...	7·2	985·6	24·10
9·5	...	68·7	...	78·2	...	...	...	55·7	4·7	...	...	701·4	32·76
3·5	...	38·3	...	87·1	...	7·0	...	...	...	...	...	529·6	15·09
15·0	...	51·6	...	98·2	16·6	10·0	...	...	...	...	...	582·4	26·51
...	..	...	...	21·7	...	...	...	...	...	...	...	347·8	5·87
...	..	47·3	...	28·8	...	6·2	...	8·2	6·2	...	...	405·3	11·79
9·0	...	53·9	...	84·2	6·7	6·3	...	17·0	3·0	...	0·3	597·0	24·35
12·9	...	58·8	...	7·1	9·4	...	...	...	1·2	...	...	439·5	33·14
18·9	...	80·9	...	6·9	24·1	...	...	75·7	...	...	3·4	767·4	25·73
33·3	...	100·0	...	...	11·1	...	...	11·1	...	...	...	666·7	19·67
4·7	...	61·0	...	...	1·6	...	...	1·6	3·1	...	...	394·4	16·28
12·9	...	66·6	...	4·6	11·0	...	...	21·1	1·4	...	0·9	503·9	25·41
18·3	...	50·9	0·1	55·2	9·7	30·4	...	9·2	4·4	0·3	1·5	663·8	27·86

APPENDIX VIII.

BRITISH OTHER RANKS.

Table showing admission and death ratios per 1,000 of strength by Commands contrasted with the previous year, and the average for the previous five years.

Commands.		Enteric group of fevers.		Influenza.		Cholera.		Small-pox.		Malaria.		Dysentery.	
		A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
Northern.	1934-38	1·7	0·15	10·9	..	..	..	0·1	0·02	62·8	0·02	22·2	0·02
	1938	1·5	0·21	10·0	..	..	..	0·1	..	56·0	0·07	21·1	0·07
	1939	1·5	0·08	9·6	..	..	..	0·1	..	67·4	0·08	18·9	0·16
Western (I.) Distt.	1934-38	0·6	..	11·7	..	..	..	..	..	118·6	0·27	37·9	..
	1938	..	..	0·6	..	..	..	..	..	59·2	0·28	42·5	..
	1939	0·5	..	6·0	..	..	..	..	..	69·2	0·42	21·5	..
Eastern	1934-38	1·8	0·12	18·4	..	0·2	..	0·2	..	37·6	0·05	27·7	0·04
	1938	0·5	0·08	18·0	..	0·1	..	0·2	..	33·0	..	29·8	0·08
	1939	0·9	0·09	8·1	..	..	..	0·3	..	31·8	..	37·2	..
Southern	1934-38	0·8	0·07	12·5	..	..	..	0·1	..	50·3	0·04	26·1	..
	1938	0·8	0·08	15·5	..	..	..	0·1	..	60·0	0·08	25·6	..
	1939	1·0		11·2	..	..	..	..	..	61·6	0·10	33·9	..
All-India	1934-38	1·4	0·11	11·0	..	0·1	0·00	0·1	0·01	55·8	0·06	26·3	0·02
	1938	0·9	0·12	13·2	..	0·0	..	0·1	..	50·4	0·07	26·8	0·05
	1939	1·1	0·08	9·4	..	..	..	0·1	..	55·1	0·11	28·9	0·03

Commands.		Pyrexia of uncertain origin.		Pneumonia, lobar and lobular.		Venereal diseases.		Dengue.		Sandfly fever.		Plague.	
		A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
Northern	1934-38	0·6	..	4·7	0·32	29·6	..	0·1	..	68·5	..	..	..
	1938	0·3	..	3·3	0·21	35·7	..	..	..	46·6	..	..	..
	1939	0·2	..	6·7	0·16	37·0	0·8	0·6	..	52·4	..	..	..
Western (E.) Distt.	1934-38	..	..	3·3	0·11	36·1	..	2·0	..	18·1	..	..	..
	1938	..	..	1·1	0·28	62·9	..	1·4	..	50·2	..	..	..
	1939	0·9	..	2·7	..	61·4	..	1·8	..	32·5	..	..	..
Eastern	1934-38	0·2	..	3·6	0·41	44·5	..	9·8	..	18·8	..	..	..
	1938	0·2	..	4·4	0·45	48·9	..	8·0	..	42·1	..	..	..
	1939	..	..	3·8	0·19	54·1	..	27·0	..	31·6	..	..	..
Southern	1934-38	0·5	..	2·9	0·21	38·6	..	8·3	..	8·7	..	..	..
	1938	0·2	..	2·8	0·25	52·4	..	4·6	..	5·0	..	..	..
	1939	0·2	..	3·3	..	64·6	..	4·3	..	3·4	..	..	..
All-India	1934-38	0·4	..	3·7	0·30	38·3	0·00	6·4	..	31·6	..	...	...
	1938	0·2	..	3·3	0·30	45·0	..	3·9	..	24·8	..	...	...
	1939	0·2	..	4·6	0·11	52·1	..	0·6	..	30·7	..	...	...

A-Admissions. D-Deaths.

APPENDIX IX.

BRITISH OFFICERS (BRITISH SERVICE).

INDIA.

I. Prewar period (January to August).
II. War period (September to December).
III. Whole year.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick during the year 1939.

Diseases.	Admissions.			Deaths.			Constantly sick.		
	I	II	III	I	II	III	I	II	III
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.									
Common cold	4·8	3·7	8·5	..	..	..	0·08	0·05	0·13
Diphtheria	2·1	3·2	5·3	..	..	..	0·24	0·45	0·69
Dysentery	23·0	12·3	35·2	..	..	..	0·69	0·54	1·23
Enteric fevers (inclusive of typhoid, para. A B & C and enteric group)	1·6	0·5	2·1	..	..	..	0·24	0·08	0·32
Erysipelas	0·5	..	0·5	..	..	..	0·01	..	0·01
Influenza	6·4	1·6	8·0	..	..	..	0·11	0·03	0·14
Malaria	17·6	18·7	36·3	..	..	..	0·58	0·55	1·13
Measles	0·5	..	0·5	..	..	..	0·02	..	0·02
Meningococcal infection	..	..	..	..	..	..	..	..	..
Mumps	0·5	..	0·5	..	..	..	0·03	..	0·03
Pneumonia	1·6	1·1	2·7	0·53	..	0·53	0·19	0·03	0·21
Pyrexia of uncertain origin	0·5	..	0·5	..	..	..	0·07	..	0·07
Rheumatic fever	..	..	..	..	..	..	0·10	..	0·10
Sandfly fever	13·9	12·8	26·7	..	..	..	0·27	0·33	0·60
Scarlet fever	..	..	..	..	..	..	..	..	..
Small pox	..	..	..	..	..	..	..	..	..
Tuberculosis — Pulmonary	2·1	1·1	3·2	..	..	..	0·16	0·11	0·27
Tuberculosis — Other	0·5	..	0·5	..	..	..	0·06	..	0·06
Venereal diseases — Gonorrhoea	..	..	..	..	..	..	..	..	..
Venereal diseases — Soft chancre	..	..	..	..	..	..	..	..	..
Venereal diseases — Syphilis	..	..	..	..	..	..	..	..	..
Venereal diseases — Other V. D.	..	..	..	..	..	..	..	..	..
Other diseases due to infection	20·8	13·3	34·2	..	..	..	0·82	0·80	1·62
Diseases due to infestation by Metazoan parasites — Scabies	..	..	..	..	..	..	..	..	..
Diseases due to infestation by Metazoan parasites — Other diseases	0·5	..	0·5	..	..	..	0·01	..	0·01

Other diseases classified under systems.

Diseases of the nervous system	6·9	1·6	8·5	0·53	..	0·53	0·23	0·06	0·29
Mental diseases	2·1	2·7	4·8	..	..	..	0·05	0·09	0·14
Diseases of the :—									
Eye	1·1	..	1·1	..	..	..	0·01	..	0·01
Ear and nose	11·7	5·9	17·6	..	..	..	0·18	0·11	0·29
Circulatory system — Valvular disease of the heart	..	0·5	0·5	..	..	..	..	0·02	0·02
Circulatory system — Disordered action of the heart	0·5	..	0·5	..	..	..	0·01	..	0·01
Circulatory system — Other diseases	1·6	0·5	2·1	..	..	..	0·03	0·04	0·07
Blood and blood forming organs	2·1	0·5	2·7	..	..	..	0·10	0·04	0·14
Ductless or endocrine glands	..	..	..	..	..	..	..	..	..
Breast	..	..	..	..	..	..	..	..	..
Respiratory system — Larynx and trachea	1·6	1·1	2·7	..	..	..	0·02	0·02	0·04
Respiratory system — Bronchi and bronchioles	5·3	0·5	5·9	..	..	..	0·10	0·01	0·11
Respiratory system — Other diseases	..	1·1	1·1	..	0·53	0·53	..	0·02	0·02
Teeth and gums	2·5	2·1	4·8	..	..	..	0·04	0·02	0·05
Digestive system — Inflammation of tonsils	11·2	10·1	21·4	..	..	..	0·17	0·23	0·40
Digestive system — Inflammation of pharynx	6·9	3·7	10·7	..	..	..	0·13	0·08	0·21
Digestive system — Inflammation of stomach	4·8	3·7	8·5	..	..	..	0·16	0·07	0·23
Digestive system — Gastric ulcer	0·5	..	0·5	..	..	..	0·08	..	0·08
Digestive system — Duodenal ulcer	1·6	0·5	2·1	..	..	..	0·06	0·01	0·07
Digestive system — Liver	16·5	5·3	21·9	..	..	..	0·69	0·29	0·98
Digestive system — Other diseases	33·6	13·9	47·5	..	..	..	1·06	0·33	1·39
Diseases due to disorders of nutrition or of metabolism	1·1	..	1·1	..	..	..	0·03	..	0·03
Diseases of the :—									
Generative system	1·1	0·5	1·6	..	..	..	0·03	0·02	0·05
Bones, joints, muscles, fasciae and bursae	5·3	3·2	8·5	..	..	..	0·17	0·08	0·25
Areolar tissues	20·3	6·9	27·2	..	..	..	0·36	0·10	0·45
Skin	6·4	2·7	9·1	..	..	..	0·22	0·06	0·28
Urinary organs	4·8	1·6	6·4	..	..	..	0·18	0·04	0·21
Injuries — General	1·6	2·7	4·3	..	..	..	0·02	0·04	0·06
Injuries — Local	27·2	15·1	42·2	0·53	..	0·53	1·09	0·66	1·76
Injuries — In action	..	..	..	..	..	..	0·02	..	0·02
Tumours and cysts	2·1	1·1	3·2	..	..	..	0·02	0·03	0·04
Poisons	..	..	..	..	..	..	..	..	..
No appreciable disease	0·5	1·1	1·6	..	..	..	0·01	0·01	0·01
Suicide	..	..	..	..	..	..	..	..	..
Total	278·7	157·0	435·7	1·60	0·53	2·14	8·96	5·39	14·35

APPENDIX X.

WIVES OF WARRANT OFFICERS, N. C. Os. AND MEN

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick during the year 1939.

Diseases.	Admissions.	Deaths.	Constantly sick.
Specific diseases due to infection or infestation.			
Common cold	2·8	..	0·05
Diphtheria	1·4	..	0·09
Dysentery	14·1	..	0·42
Enteric fevers (inclusive of typhoid, para. A, B and C and enteric group).	1·1	0·28	0·14
Erysipelas	0·6	..	0·02
Influenza	1·4	...	0.02
Malaria	21·3	...	0·75
Measles	0·8	..	0·03
Meningococcal infection	..	..	..
Mumps	..	..	..
Pneumonia	1·7	..	0·16
Pyrexia of uncertain origin	..	...	..
Rheumatic fever	1·1	..	0·06
Sandfly fever	3·9	..	0·07
Scarlet fever	..	..	..
Smallpox	0·3	..	0·02
Tuberculosis — Pulmonary	0·3	..	0·07
Tuberculosis — Other	..	...	..
Venereal diseases — Gonorrhœa	..	..	..
Venereal diseases — Soft chancre	..	..	..
Venereal diseases — Syphilis	0·3	..	0·02
Venereal diseases — Other V. D.	..	..	..
Other diseases due to infection	3·0	..	0·09
Diseases due to infestation by metazoan parasites — Scabies	..	..	..
Diseases due to infestation by metazoan parasites — Other diseases	3·3	..	0·04
Other diseases classified under system.			
Diseases of the nervous system	3·3	..	0·13
Mental diseases	3·3	..	0·36
Diseases of the—			
Eye	1·1	..	0·02
Ear and nose	3·6	..	0 08
Diseases of the circulatory system — Valvular diseases of the heart	1·4	..	0·04
Diseases of the circulatory system — Disordered action of the heart	1·7	..	0·04
Diseases of the circulatory system — Other diseases	0·6	0·28	0·08
Diseases of the blood and blood forming organs	5·3	..	0·21
Diseases of ductless or endocrine glands	1·1	..	0·06
Diseases of the breast	3·0	..	0·12
Diseases of the respiratory system — Larynx and trachea	..	..	..
Diseases of the respiratory system — Bronchi and brochioles	5·8	..	0·15
Diseases of the respiratory system — Other diseases	0·8	..	0·06

APPENDIX X—*contd.*

		Admissions	Deaths	Constantly sick.
Other diseases classified under system—contd.				
Diseases of the teeth and gums		1·7	..	0·02
Diseases of the digestive system.	Inflammation of tonsils	9·1	..	0·15
	Inflammation of pharynx	2·2	..	0·02
	Inflammation of stomach	2·8	..	0·06
	Gastric ulcer	1·4	..	0·07
	Duodenal ulcer	0·3	..	0·01
	Liver	0·6	..	0·01
	Other diseases	36·0	..	0 99
Diseases due to disorders of nutrition or of metabolism		0·6	..	0·04
Diseases of the	Generative system	88·4	0·23	3·05
	Bones, joints, muscles, fascia and bursæ	3·0	..	0·09
	Areolar tissues	0·4	..	0·24
	Skin	3·3	..	0·10
	Urinary organs	7·8	..	0·23
Injuries	General	..	..	..
	Local	3·3	..	0·15
	Inaction	..	..	..
Tumours and cysts		3·3	..	0·13
Poisons		0·6	..	0·01
No appreciable disease		1·7	..	0.02
Suicides		..	..	..
	TOTAL	263·9	0·83	8·78

APPENDIX XI.

BRITISH OTHER RANKS' CHILDREN.

Table showing ratios per 1,000 of the strength of admission into hospital, deaths and constantly sick, during the year 1939.

Diseases.	Admissions.	Deaths.	Constantly sick.
Specific diseases due to infection or infestation.			
Common cold	6·1	..	0·08
Diphtheria	6·6	0·38	0·55
Dysentery	41·8	1·14	1·50
Enteric fevers (inclusive of typhoid, para A, B and C, and enteric group).	1·9	..	0·24
Erysipelas	...	..	..
Influenza	4·7	..	0·10
Malaria	19·9	0·19	0·66
Measles	2·3	..	0·07
Meningococcal infection	...	..	..
Mumps	1·3	..	0·05
Pneumonia	10·0	1·70	0·37
Pyrexia of uncertain origin	0·2	..	0·01
Rheumatic fever	0·6	..	0·05
Sandfly fever	0·9	..	0·02
Scarlet fever	1·3	..	0·10
Smallpox	..	..	..
Tuberculosis — Pulmonary	0·2	..	0·02
Tuberculosis — Other	1·5	..	0·19
Venereal diseases — Gonorrhœa	0·2	..	0·01
Venereal diseases — Soft chancre	...	..	..
Venereal diseases — Syphilis	..	..	..
Venereal diseases — Other V. D.	..	..	..
Other diseases due to infection	16·5	0·76	0·51
Diseases due to infestation by metazoan parasites. — Scabies	..	..	..
Diseases due to infestation by metazoan parasites. — Other diseases	3·4	..	0·04
Other diseases classified under system.			
Diseases of the nervous system	4·7	1·32	0·25
Mental diseases	0·4	..	0·02
Diseases of the — Eye	8·3	..	0·36
Diseases of the — Ear and nose	15·3	..	0·46
Diseases of the circulatory system. — Valvular diseases of the heart	0·2	0·19	0.00
Diseases of the circulatory system. — Disordered action of the heart	0·2	..	0·01
Diseases of the circulatory system. — Other diseases	0·2	..	0·01
Diseases of the blood and blood forming organs	6·1	0·19	0·18
Diseases of ductless or endocrine glands	0·4	..	0·01
Diseases of the breast	..	..	..
Diseases of the respiratory system. — Larynx and trachea	1·7	..	0·02
Diseases of the respiratory system. — Bronchi and bronchioles	18·0	..	0·44
Diseases of the respiratory system. — Other diseases	0·4	0·38	0·00
Diseases of the teeth and gums	5·5	..	0·10
Diseases of the digestive system. — Inflammation of tonsils	27 4	..	0·54
Diseases of the digestive system. — Inflammation of pharynx	3·8	..	0·05
Diseases of the digestive system. — Inflammation of stomach	2·5	..	0·04
Diseases of the digestive system. — Gastric ulcer	..	..	..
Diseases of the digestive system. — Duodenal ulcer	...	..	..
Diseases of the digestive system. — Liver	1·1	..	0·04
Diseases of the digestive system. — Other diseases	103·5	2.65	2·15
Diseases due to disorders of nutrition or of metabolism	4·7	1·32	0·16
Diseases of the generative system	5·7	0·95	0·06
Diseases of bones, joints, muscles, fasciæ and bursæ	2·8	..	0·19
Diseases of the areolar tissues	11·4	..	0·44
Diseases of the skin	5·5	..	0·23
Diseases of the urinary organs	5·5	0·19	0·36
Injuries — General	0·9	0·19	0·02
Injuries — Local	14·2	..	0·50
Injuries — In action	...	..	..
Tumours and cysts	1·1	0·57	0·04
Poisons	0·2	0·19	0·00
No appreciable disease	8·0	..	0·16
Suicides	..	..	..
Total	374·1	12·30	11·43

APPENDIX XII. (*i*).

VACCINATION PERFORMED IN THE BRITISH AND INDIAN ARMIES DURING 1939—OFFICERS AND OTHER RANKS.

Commands.	British Troops.							
	Officers.				Warrant and N. C. Officers and men.			
	Number.		Percentage of successful cases to total operations.		Number.		Percentage of successful cases to total operations.	
	P.	R.	P.	R.	P.	R.	P.	R.
Northern								
Western (I) Dist.	21	147	95	80	282	3,398	83	78
Eastern	..	48	..	87	..	571	..	94
Southern	1	165	100	62	7	5,171	85	68
	..	98	..	81	35	1,958	49	76
Total	22	458	95	74	324	11,098	80	74

Commands.	Indian Troops.											
	King's Commissioned officers.				Indian commissioned, Non-commissioned officers and men.				Followers.			
	Number.		Percentage of successful cases to total operations.		Number.		Percentage of successful cases to total operations.		Number.		Percentage of successful cases to total operations.	
	P.	R.	P.	R.	P.	R.	P.	R.	P.	R.	P.	R.
Northern												
Western (I) Dist.	12	234	83	75	431	24,770	99	67	100	4,613	51	68
Eastern	..	36	..	83	4	2,234	100	67	18	428	83	76
Southern	..	191	..	38	251	12,515	88	49	81	1,677	93	54
	..	79	..	68	41	5,899	100	63	11	1,557	100	86
Total	12	540	83	61	727	45,418	95	62	210	8,275	72	69.

P.—Primary.

R.—Revaccination.

APPENDIX XII (*ii*).

VACCINATION PERFORMED IN THE FAMILIES—BRITISH ARMY DURING 1939.

Commands.	Women.				Children.			
	Number.		Percentage of successful cases to total operations.		Number.		Percentage of successful cases to total operations.	
	P.	R.	P.	R.	P.	R.	P.	R.
Northern . .	32	263	3	75	166	274	71	85
Western (I) Dist. .	..	87	..	88	35	67	100	79
Eastern . .	1	405	100	62	144	344	97	48
Southern . .	42	246	95	74	114	242	96	72
Total	75	1,001	56	71	459	927	88	67

P.—Primary. R.—Revaccination.

APPENDIX XII (*iii*).

VACCINATION PERFORMED IN THE FAMILIES—INDIAN ARMY DURING 1939.

Commands.	Women.				Children.			
	Number.		Percentage of successful cases to total operations.		Number.		Percentage of successful cases to total operations.	
	P.	R.	P.	R.	P.	R.	P.	R.
Northern . .	12	82	67	77	52	46	83	65
Western (I) Dist. .	..	10	..	90	4	5	100	100
Eastern . .	..	58	..	52	15	39	100	54
Southern . .	..	47	..	57	8	23	87	96
Total	12	197	67	65	79	110	91	71

P.—Primary. R.—Revaccination.

APPENDICES

INDIAN TROOPS, 1939.

TABLE B.

STATIONS BY COMMANDS AND INDEPENDENT DISTRICTS.

Stations.	*Height above M. S. level in feet.	Authority for height.	Points of reference.
Northern Command.			
Abbottabad	4,010	S. D.	Map.
Ambala	902	,,	S.B.M.
Amritsar	754	,,	,,
Bakloh	4,585	,,	Map.
Bannu	1,250	,,	,,
Campbellpore	1,180	,,	,,
Chitral	4,980	,,	,,
Dagshai	6,087	,,	,,
Dalhousie	7,687	,,	,,
Dera Ismail Khan	568	,,	S.B.M.
Dharamsala Cantt.	4,500	,,	Map.
Drosh Fort	4,340	,,	,,
Ferozepore	649	,,	S.B.M.
Jhelum	762	,,	,,
Jullundur Cantt.	771	,,	B.M.
Jutogh	6,370	,,	Map.
Kalabagh and Baragali	7,963	,,	,,
Kalabagh and Marl Indus	682	,,	,,
Kohat	1,725	,,	,,
Kuldana	7,049	S. G.	,,
Lahore Cantonment	706	S.D.	S.B.M.
Landikotal	3,509	,,	Map.
Lockhart Fort	6,613	,,	,,
Malakand	2,740	,,	,,
Manzai	1,650	,,	,,
Mardan	1,000	,,	,,
Mir Ali	2,240	S.G.	V.G.L.
Mona	3,500	S.D.	Map.
Multan	404	,,	S.B.M.
Nowshera (Ry. Station)	966	,,	B.M.
Peshawar	1,152	,,	S.B.M.
Rawalpindi	1,689	,,	,,
Razmak	6,556	,,	Map.
Risalpur	1,014	,,	B.M.
Shagai	3,174	,,	,,
Sargodha (Railway Rest House)	615	,,	,,
Sialkot	829	,,	,,
Thall	2,450	,,	Map.
Wana	4,630	,,	V.G.L.
Western (Ind.) District.			
Chaman Fort	5,502	S.D.	Map.
Fort Sandeman	4,600	,,	,,
Hindubagh	5,821	,,	,,
Hyderabad (Sind)	96	,,	S.B.M.
Karachi (Holy Trinity Church)	28	,,	,,
Loralai	4,699	,,	Map.
Quetta.	5,510	,,	S.B.M.

Stations.	*Height above M. S. level in feet.	Authority for height.	Points of reference.
Eastern Command.			
Agra (Fort)	525	S.D.	S.B.M.
Alipore	17	,,	B.M.
Allahabad	314	,,	S.B.M.
Almora	6,494	,,	Map.
Bareilly	563	,,	S.B.M.
Benares	256	,,	,,
Cawnpore	407	,,	B.M.
Chittagong	..	..	..
Comilla	..	..	..
Dacca	20	M.D.	..
Dehra Dun	2,232	S.D.	S.B.M.
Delhi	757	,,	,,
Dinapore	170	,,	Church
Fatehgarh	467	,,	S.B.M.
Fyzabad	330	,,	S.B.M.
Ghoom	7,313	,,	Jn. of road.
Gyantse	13,120	,,	Map.
Gorakhpore	..	..	..
Jhansi	849	S.D.	S.B.M.
Lansdowne	5,823	,,	Map.
Lucknow	383	,,	B.M.
Meerut	737	,,	S.B.M.
Midnapore	..	..	..
Muttra	560	S.D.	S.B.M.
Nowgong	735	,,	B.M.
Roorkee	879	,,	S.B.M.
Saidpur	..	..	..
Shillong	4,921	S.D.	Map.
Southern Command.			
Ahmedabad	162	S.D.	S.B.M.
Ahmednagar	2,180	,,	Map.
Aurangabad	1,905	M.D.	,,
Bangalore	3,002	S.D.	S.B.M.
Baroda	114	,,	B.M.
Belgaum	2,523	,,	S.B.M.
Bombay (town hall)	20	,,	,,
Cannanore	40	,,	..
Deolali	1,894	,,	S.B.M.
Jubbulpore	1,320	,,	,,
Kamptee (Rly. Station).	940	,,	B.M.
Mhow (Ry. Station)	1,887	,,	..
Mount Abu (Sanitorium)	3,836	,,	..
Nasirabad	1,461	,,	B.M.
Pachmarhi	3,490	,,	,,
Poona	1,887	,,	S.B.M.
Saugor	1,755	,,	,,
St. Thos. Mount (Ry. Station)	34	,,	B.M.
Trichinopoly	256	,,	S.B.M.
Trimulgherry	1,843	,,	Map.
Wellington (Stn. Hospl.)	5,800	,,	,,

* These heights are usually those of the survey-marks or of the mercury surface in barometer cisterns of meteorological observatories.

S. D. = Survey Department (Map Publication Office).
S. G. = Surveyor-General of India.
S.B.M. = Standard Bench Mark.
V.G.L. = Village Ground Level.
M.D. = Meteorological Department.
B.M. = G. T. Bench Mark.
Map. = Heights taken from Topo. Maps.

APPENDIX XIII.

INDIAN OFFICERS AND INDIAN OTHER RANKS.

ALL-INDIA.

I. Pre-war period (January to August).
II. War period (September to December).
III. Whole year.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick, during the year 1939.

Diseases.	Admissions.			Deaths.			Invalids.			Constantly sick.		
	I	II	III	I	II	III	I	II	III	I	II	III
Specific diseases due to infection or infestation.												
Common cold	8·5	7·2	15·7	..	..	..	..	..	..	0·15	0·13	0·28
Diphtheria	..	0·0	0·0	..	..	..	..	..	..	0·00	0·00	0·00
Dysentery	9·0	8·0	17·1	0·03	0·02	0·04	..	..	..	0·33	0·30	0·62
Enteric fevers (inclusive of typhoid, para. A, B & C and enteric group)	0·3	0·2	0·5	0·03	0·03	0·06	..	..	..	0·05	0·03	0·08
Erysipelas	..	0·0	0·0	..	..	..	..	..	..	..	0·00	0·00
Influenza	2·3	1·3	3·7	0·01	..	0·01	..	..	..	0·06	0·03	0·09
Malaria	46·7	71·5	118·3	0·01	..	0·01	0·02	..	0·02	1·17	1·79	2·96
Measles	0·9	0·3	1·3	..	..	..	..	..	..	0·04	0·01	0·06
Meningococcal infection	0·1	0·1	0·2	0·03	0·02	0·04	0·01	..	0·01	0·02	0·01	0·03
Mumps	5·8	1·3	7·0	..	..	..	..	..	..	0·30	0·07	0·37
Pneumonia	3·3	2·1	5·4	0·20	0·08	0·29	0·01	..	0·01	0·26	0·13	0·39
Pyrexia of uncertain origin	0·1	0·0	0·1	..	0·01	0·01	..	..	..	0·01	0·00	0·01
Rheumatic fever	0·4	0·3	0·7	..	..	..	0·02	0·03	0·04	0·04	0·01	0·05
Sandfly fever	4·1	1·8	6·0	..	..	..	..	..	..	0·07	0·04	0·11
Scarlet fever	..	..	..	..	..	..	..	..	..	..	..	..
Smallpox	0·1	0·0	0·2	0·03	..	0·03	..	..	..	0·01	0·00	0·01
Tuberculosis — Pulmonary	1·3	0·6	1·9	0·05	0·01	0·06	1·13	0·57	1·70	0·16	0·06	0·22
Tuberculosis — Other	0·2	0·1	0·3	0·03	0·01	0·04	0·16	0·06	0·22	0·05	0·02	0·07
Venereal diseases — Gonorrhoea	1·7	1·7	3·4	..	..	..	0·02	..	0·02	0·14	0·14	0·28
Venereal diseases — Soft chancre	0·6	0·5	1·2	..	..	..	..	..	..	0·06	0·04	0·10
Venereal diseases — Syphilis	1·9	1·5	3·4	..	0·01	0·01	0·01	0·02	0·03	0·18	0·13	0·31
Venereal diseases — Other V. D.	0·0	0·5	0·6	..	..	..	..	..	..	0·00	0·03	0·04

APPENDIX XIII—*contd.*

Diseases.	Admissions.			Deaths.			Invalids.			Constantly sick.		
	I	II	III	I	II	III	I	II	III	I	II	III
Other diseases due to infection	4·8	2·8	7·6	0·08	0·07	0·14	0·06	0·06	0·12	0·32	0·16	0·48
Diseases due to infestation by metazoan parasites. — Scabies	6·3	5·6	11·9	..	..	..	..	..	..	0·21	0·18	0·39
Diseases due to infestation by metazoan parasites. — Other diseases	6·1	2·9	9·0	..	..	..	..	0·03	0·03	0·27	0·14	0·41
Other diseases classified under systems.												
Diseases of the nervous system	2·1	1·9	3·9	0·06	0·04	0·10	0·20	0·18	0·38	0·10	0·10	0·19
Mental diseases	0·6	0·7	1·3	0·01	..	0·01	0·26	0·21	0·48	0·06	0·06	0·11
Diseases of the :—												
Eye	7·7	4·9	12·6	..	..	..	0·21	0·14	0·36	0·32	0·18	0·49
Ear and nose	4·6	4·7	9·3	..	0·01	0·01	0·03	0·06	0·09	0·15	0·13	0·28
Circulatory system. — Valvular disease of the heart	0·1	0·0	0·1	0·01	..	0·01	0·03	0·02	0·05	0·01	0·00	0·01
Circulatory system. — Disordered action of the heart	0·3	0·2	0·4	0·02	0·04	0·07	0·03	0·01	0·04	0·01	0·01	0·02
Circulatory system. — Other diseases	0·3	0·3	0·6	0·04	0·03	0·08	0·05	0·02	0·07	0·03	0·01	0·05
Blood and blood forming organs	3·2	1·8	5·0	0·01	0·02	0·03	0·05	0·02	0·07	0·19	0·10	0·29
Ductless or endocrine glands	0·8	0·8	1·5	..	..	..	0·01	0·02	0·03	0·00	0·00	0·01
Breast	0·0	0·0	0·0	..	..	..	..	..	..	0·00	0·00	0·00
Respiratory system. — Larynx and trachea	0·6	0·3	0·9	..	..	..	..	..	..	0·02	0·01	0·03
Respiratory system. — Bonchi and bronchioles	8·2	5·7	14·0	0·01	..	0·01	0·06	0·11	0·17	0·27	0·19	0·46
Respiratory system. — Other diseases	1·2	0·6	1·8	0·03	..	0·03	0·08	0·08	0·16	0·14	0·04	0·18
Teeth and gums	2·2	1·1	3·4	..	..	..	..	0·11	0·11	0·07	0·03	0·09
Inflammation of tonsils	3·6	1·9	5·5	..	..	..	..	..	..	0·09	0·04	0·13
Inflammation of pharynx	16·7	7·4	24·1	0·01	..	0·01	..	..	..	0·30	0·14	0·44

Digestive system.	Inflammation of stomach	0·7	0·5	1·2	..	..	..	0·01	..	0·01	0·02	0·01	0·04
	Gastric ulcer	0·0	0·1	0·1	0·01	..	0·01	..	0·04	0·04	0·00	0·01	0·01
	Duodenal ulcer	0·0	0·0	0·0	..	..	..	..	..	..	0·00	0·00	0·00
	Liver	0·6	0·5	1·2	0·01	0·02	0·03	..	..	..	0·04	0·04	0·08
	Other diseases	14·8	9·7	24·5	0·06	0·03	0·08	0·08	0·14	0·22	0·48	0·33	0·80
Diseases due to disorders of nutrition or of metabolism		0·1	0·1	0·2	..	..	..	0·04	0·05	0·09	0·01	0·01	0·03
Diseases of the—													
Generative system		1·6	1·1	2·7	..	..	..	0·02	0·03	0·04	0·07	0·04	0·11
Bones, joints, muscles, fasciae and bursae		6·8	4·4	11·2	0·01	..	0·01	0·31	0·22	0·53	0·34	0·19	0·52
Areolar tissues		19·6	14·5	34·1	0·01	..	0·01	..	..	..	0·61	0·44	1·05
Skin		9·3	7·5	16·9	0·01	..	0·01	0·04	0·02	0·06	0·39	0·30	0·68
Urinary organs		1·8	1·3	3·1	0·03	0·01	0·03	0·03	0·03	0·07	0·11	0·06	0·16
Injuries	General	0·2	0·1	0·4	0·08	0·08	0·16	..	..	..	0·01	0·00	0·01
	Local	35·7	20·3	56·0	0·21	0·04	0·25	0·61	0·33	0·95	1·49	0·84	2·33
	In action	0·5	0·5	0·9	0·18	0·20	0·38	0·11	0·02	0·13	0·07	0·07	0·14
Tumours and cysts		0·9	0·5	1·4	..	..	..	0·07	0·04	0·11	0·04	0·03	0·07
Poisons		0·2	0·1	0·3	0·03	0·03	0·06	..	..	..	0·01	0·00	0·01
No appreciable disease		0·4	0·4	0·9	..	..	..	..	0·01	0·01	0·02	0·02	0·04
* Suicides		..	0·0	0·0	0·02	0·05	0·07	..	..	..	..	0·00	0·00
Total		250·0	204·0	454·0	1·32	0·79	2·12	3·78	2·65	6·43	9·36	6·88	16·25

* The figures against "suicides" having already been shown under the heading of the injury, etc., which caused death, are not included in the total.

APPENDIX XIV.

INDIAN OFFICERS AND INDIAN OTHER RANKS. I. Pre-war period (January to August).
NORTHERN COMMAND. II. War period (September to December).
III. Whole year.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths numbers invalided and constantly sick during the year 1939.

Diseases.	Admissions.			Deaths.			Invalids.			Constantly sick.		
	I	II	III	I	II	III	I	II	III	I	II	III
Specific diseases due to infection or infestation.												
Common cold	7·8	4·2	11·9	..	..	..	..	..	..	0·14	0·06	0·20
Diphtheria	..	..	..	..	..	..	..	..	..	0·00	..	0·00
Dysentery	7·6	8·2	15·8	0·02	0·03	0·05	..	..	..	0·27	0·30	0·57
Enteric fevers (inclusive of typhoid, para. A, B & C and enteric group)	0·3	0·3	0·5	0·03	..	0·03	..	..	..	0·04	0·04	0·08
Erysipelas	..	0·0	0·0	..	..	..	..	..	..	..	0·00	0·00
Influenza	2·7	0·7	3·4	0·02	..	0·02	..	..	..	0·08	0·01	0·10
Malaria	52·5	72·0	124·5	0·02	0·03	0·05	0·02	..	0·02	1·17	1·56	2·73
Measles	1·0	0·6	1·6	..	..	..	..	..	..	0·04	0·02	0·06
Meningococcal infection	0·2	0·1	0·3	0·03	..	0·03	0·02	..	0·02	0·03	0·01	0·04
Mumps	8·6	1·2	9·7	..	..	..	..	..	..	0·44	0·06	0·50
Pneumonia	3·6	2·1	5·7	0·20	0·05	0·25	..	..	..	0·30	0·12	0·42
Pyrexia of uncertain origin	0·0	0·1	0·1	..	0·02	0·02	..	..	..	0·01	0·01	0·02
Rheumatic fever	0·3	0·3	0·5	..	..	..	0·02	0·02	0·03	0·03	0·01	0·04
Sandfly fever	5·8	1·9	7·8	..	..	..	..	..	..	0·10	0·03	0·13
Scarlet fever	..	..	..	..	..	..	..	..	..	..	..	..
Smallpox	0·2	0·1	0·2	0·03	..	0·03	..	..	..	0·01	0·00	0·02
Tuberculosis — Pulmonary	1·3	0·6	1·9	0·05	..	0·05	1·13	0·56	1·68	0·14	0·05	0·20
Tuberculosis — Other	0·3	0·0	0·3	0·02	..	0·02	0·17	0·03	0·20	0·06	0·01	0·06
Venereal diseases — Gonorrhoea	1·2	1·0	2·2	..	..	..	..	..	..	0·10	0·08	0·18
Venereal diseases — Soft chancre	0·3	0·1	0·5	..	..	..	..	..	..	0·04	0·02	0·06
Venereal diseases — Syphilis	1·4	0·8	2·2	..	0·02	0·02	0·02	..	0·02	0·15	0·09	0·24
Venereal diseases — Other V. D.	..	0·4	0·4	..	..	..	..	..	..	..	0·03	0·03

Other diseases due to infection	4·9	2·6	7·5	0·10	0·03	0·13	0·07	0·13	0·20	0·37	0·16	0·53
Diseases due to infestation by metazoan parasites. — Scabies	6·5	4·4	10·9	..	..	..	..	..	..	0·20	0·15	0·35
Diseases due to infestation by metazoan parasites. — Other diseases	7·6	3·3	10·8	..	..	..	..	..	..	0·29	0·15	0·45
Other diseases classified under systems.												
Diseases of the nervous system	2·1	1·5	3·6	0·03	0·05	0·08	0·20	0·19	0·39	0·10	0·09	0·19
Mental diseases	0·6	0·6	1·2	..	..	..	0·27	0·25	0·52	0·05	0·06	0·11
Diseases of the :—												
Eye	7·0	4·8	11·9	..	..	..	0·13	0·12	0·25	0·29	0·16	0·45
Ear and nose	3·9	3·5	7·5	..	0·02	0·02	0·02	0·02	0·03	0·15	0·09	0·24
Circulatory system. — Valvular diseases of the heart.	0·0	0·0	0·1	..	..	..	0·02	0·02	0·03	0·01	0·00	0·01
Circulatory system. — Disordered action of the heart.	0·1	0·1	0·2	0·02	0·02	0·03	0·02	0·02	0·03	0·01	0·01	0·01
Circulatory system. — Other diseases	0·2	0·2	0·4	0·03	0·03	0·07	0·05	0·02	0·07	0·02	0·01	0·03
Blood and blood forming organs	3·2	2·0	5·2	0·02	0·03	0·05	0·08	0·02	0·10	0·19	0·10	0·29
Ductless or endocrine glands	0·1	0·1	0·1	..	..	..	0·02	0·03	0·05	0·01	0·00	0·01
Breast	0·0	..	0·0	..	..	..	..	..	..	0·00	..	0·00
Respiratory system. — Larynx and trachea.	0·7	0·6	1·3	..	..	..	..	..	..	0·02	0·02	0·04
Respiratory system. — Bronchi and bronchioles.	8·3	5·0	13·3	0·02	..	0·02	0·05	0·03	0·08	0·26	0·16	0·43
Respiratory system. — Other diseases	1·3	1·0	2·3	0·02	..	0·02	0·08	0·15	0·24	0·13	0·07	0·20
Teeth and gums	2·5	1·2	3·7	..	..	..	..	0·19	0·19	0·08	0·03	0·11
Digestive system. — Inflammation of tonsils.	3·3	2·0	5·3	..	..	..	..	..	..	0·08	0·04	0·12
Digestive system. — Inflammation of pharynx.	22·0	9·1	31·2	0·02	..	0·02	..	..	..	0·38	0·17	0·54
Digestive system. — Inflammation of stomach.	0·5	0·4	0·9	..	..	..	0·02	..	0·02	0·01	0·02	0·03
Digestive system. — Gastric ulcer	..	0·0	0·0	..	..	..	..	..	..	..	0·00	0·00
Digestive system. — Duodenal ulcer	0·0	0·0	0·1	..	..	..	..	..	..	0·00	0·00	0·00
Digestive system. — Liver	0·4	0·3	0·7	0·02	..	0·02	..	..	..	0·03	0·02	0·05
Digestive system. — Other diseases	14·8	8·2	22·9	0·05	0·02	0·07	0·02	0·13	0·15	0·47	0·29	0·75
Diseases due to disorders of nutrition or of metabolism.	0·1	0·1	0·1	..	..	..	0·02	0·02	0·03	0·01	0·01	0·02

APPENDIX XIV—*contd.*

Diseases.	Admissions.			Deaths.			Invalids.			Constantly sick.		
	I	II	III	I	II	III	I	II	III	I	II	III
Specific diseases due to infection or infestation—contd.												
Diseases of the—												
Generative system	1·6	0·9	2·5	..	..	..	0·02	0·02	0·03	0·07	0·03	0·10
Bones, joints, muscles, fasciae and bursae.	6·8	3·7	10·5	0·02	..	0·02	0·20	0·15	0·35	0·34	0·17	0·50
Areolar tissues	19·4	13·4	32·8	0·02	..	0·02	..	..	..	0·60	0·42	1·02
Skin	10·0	7·0	16·9	..	..	..	0·02	..	0·02	0·43	0·28	0·72
Urinary organs	1·8	1·8	3·6	..	0·02	0·02	0·02	0·02	0·03	0·10	0·07	0·17
Injuries — General	0·3	0·1	0·4	0·07	..	0·07	..	..	..	0·01	0·00	0·01
Injuries — Local	34·4	20·0	54·3	0·25	0·03	0·29	0·54	0·25	0·79	1·43	0·88	2·31
Injuries — In action	1·0	0·9	1·9	0·35	0·39	0·74	0·22	0·03	0·25	0·13	0·14	0·27
Tumours and cysts	0·8	0·4	1·2	..	..	..	0·10	0·02	0·12	0·04	0·02	0·06
Poisons	0·2	0·2	0·4	0·03	0·02	0·05	..	..	..	0·01	0·00	0·01
No appreciable disease	0·5	0·4	0·9	..	..	..	..	0·02	0·02	0·03	0·02	0·05
Suicides*	..	0·0	0·0	0·02	0·02	0·03	..	..	..	..	0·00	0·00
Total	262·0	194·1	456·1	1·48	0·81	2·29	3·54	2·34	5·88	9·52	6·37	15·88

* The figures against "Suicides" having already been shown under the heading of the injury, etc., which caused death, are not included in the total.

APPENDIX XV.

INDIAN OFFICERS AND INDIAN OTHER RANKS.
WESTERN (INDEPENDENT) DISTRICT.

I. Pre-war period (January to August).
II. War period (September to December).
III. Whole year.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick, during the year 1939.

Diseases.	Admissions.			Deaths.			Invalids.			Constantly sick.		
	I	II	III	I	II	III	I	II	III	I	II	III
Specific diseases due to infection or infestation.												
Common cold	13·4	12·2	25·6	..	..	..	..	..	..	0·27	0·25	0·52
Diphtheria	..	..	..	..	..	..	..	..	..	..	..	..
Dysentery	7·8	7·3	15·1	..	..	..	..	..	..	0·33	0·26	0·59
Enteric fevers (inclusive of typhoid, para. A, B & C and enteric group).	0·9	0·1	1·0	0·09	..	0·09	..	..	..	0·18	0·01	0·19
Erysipelas	..	..	..	..	..	..	..	..	..	..	..	..
Influenza	0·2	0·6	0·8	..	..	..	..	..	..	0·00	0·01	0·01
Malaria	57·3	64·3	121·6	..	..	..	..	..	..	1·81	2·21	4·02
Measles	1·2	..	1·2	..	..	..	..	..	..	0·06	0·00	0·07
Meningococcal infection	..	..	..	..	..	..	..	..	..	..	..	..
Mumps	3·5	0·3	3·8	..	..	..	..	..	..	0·20	0·04	0·25
Pneumonia	3·3	2·1	5·4	0·09	0·35	0·44	..	..	..	0·29	0·16	0·45
Pyrexia of uncertain origin	..	0·1	0·1	..	..	..	..	..	..	..	0·01	0·01
Rheumatic fever	0·7	..	0·7	..	..	..	..	..	..	0·05	..	0·05
Sandfly fever	11·1	2·6	13·7	..	..	..	..	..	..	0·20	0·08	0·28
Scarlet fever	..	..	..	..	..	..	..	..	..	..	..	..
Smallpox	..	..	..	..	..	..	..	..	..	..	..	..
Tuberculosis — Pulmonary	1·0	0·3	1·3	0·09	..	0·09	0·62	0·70	1·32	0·16	0·08	0·23
Tuberculosis — Other	0·1	..	0·1	..	..	..	..	..	..	0·01	..	0·01

APPENDIX XV—*contd.*

Diseases.	Admissions.			Deaths.			Invalids.			Constantly sick.		
	I	II	III	I	II	III	I	II	III	I	II	III
***Specific diseases due to infection or infestation*—contd.**												
Venereal diseases — Gonorrhoea	1·5	0·8	2·3	..	..	..	..	..	..	0·11	0·06	0·17
Venereal diseases — Soft chancre	0·7	0·4	1·1	..	..	..	..	..	..	0·09	0·06	0·14
Venereal diseases — Syphilis	1·0	0·8	·8	..	..	..	..	..	..	0·11	0·07	0·18
Venereal diseases — Other V. D.	..	0·3	0·3	..	..	..	..	..	..	..	0·03	0·03
Other diseases due to infection	3·3	3·4	6·8	..	..	..	..	..	..	0·22	0·23	0·45
Diseases due to infestation by metazoan parasites — Scabies	4·0	2·5	6·4	..	..	..	..	..	..	0·16	0·07	0·23
Diseases due to infestation by metazoan parasites — Other diseases	2·5	2·8	5·2	0·18	..	0·18	..	0·09	0·09	0·16	0·16	0·32
Other diseases classified under systems.												
Diseases of the nervous system	1·1	2·0	3·1	0·09	0·09	0·18	0·09	..	0·09	0·06	0·09	0·15
Mental diseases	0·6	0·3	0·9	..	..	..	0·18	0·18	0·35	0·05	0·04	0·09
Diseases of the :—												
Eye	5·2	2·6	7·8	..	..	..	0·26	0·18	0·44	0·30	0·13	0·43
Ear and nose	3·0	2·0	5·0	..	..	..	..	..	..	0·08	0·08	0·16
Circulatory system — Valvular diseases of the heart.	0·1	0·1	0·2	0·09	..	0·09	..	0·09	0·09	0·02	0·01	0·03
Circulatory system — Disordered action of the heart.	0·2	..	0·2	..	..	..	..	..	..	0·01	..	0·01
Circulatory system — Other diseases	0·4	0·3	0·7	..	..	..	..	..	..	0·02	0·01	0·03
Blood and blood forming organs	2·6	1·0	3·6	..	..	..	..	..	..	0·21	0·08	0·28
Ductless or endocrine glands	..	0·2	0·2	..	..	..	..	..	..	..	0·01	0·01
Breast	..	..	..	..	..	..	..	..	..	..	..	..

Respiratory system.	Larynx and trachea.	0·8	0·1	0·9	..	..	..	..	..	..	0·02	0·01	0·03
	Bronchi and bronchioles.	11·0	4·3	15·3	..	..	..	..	..	..	0·32	0·13	0·46*
	Other diseases .	1·0	1·0	1·9	..	..	..	0·18	0·09	0·26	0·16	0·07	0·23
Teeth and gums . . .		1·8	0·9	2·7	..	..	..	..	..	..	0·04	0·02	0·06
Digestive system.	Inflammation of tonsils.	4·3	1·6	5·9	..	..	..	..	..	..	0·13	0·03	0·16
	Inflammation of pharynx.	21·0	8·1	29·1	..	..	..	..	..	..	0·40	0·16	0·55
	Inflammation of stomach.	0·6	0·2	0·8	..	..	..	..	..	..	0·02	0·00	0·03
	Gastric ulcer .	..	..	..	..	..	..	..	..	..	..	..	..
	Duodenal ulcer .	..	0·1	0·1	..	..	..	..	..	..	..	0·00	0·00
	Liver . .	1·0	0·7	1·7	..	0·09	0·09	..	..	..	0·11	0·07	0·18
	Other diseases .	14·3	9·3	23·6	..	..	..	0·09	0·09	0·18	0·47	0·28	0·75
Diseases due to disorders of nutrition or of metabolism.		0·1	0·2	0·3	..	..	..	0·09	0·18	0·26	0·00	0·03	0·04
Diseases of the :—													
Generative system . . .		0·9	0·3	1·2	..	..	..	..	..	..	0·03	0·02	0·05
Bones, joints, muscles, fasciae and bursae.		6·3	2·4	8·7	..	..	..	0·09	..	0·09	0·27	0·17	0·44
Areolar tissues . . .		11·9	7·8	19·7	..	..	..	..	..	..	0·40	0·20	0·60
Skin		6·7	3·4	10·1	..	..	..	..	0·09	0·09	0·26	0·15	0·41
Urinary organs . . .		2·1	1·0	3·1	0·09	..	0·09	..	0·09	0·09	0·17	0·05	0·22
Injuries .	General . .	..	..	..	0·09	0·09	0·18	..	..	..	..	..	..
	Local . .	29·4	12·1	41·5	0·26	..	0·26	0·35	0·18	0·52	1·09	0·55	1·64
	In action . .	..	..	..	..	..	..	..	..	..	..	..	..
Tumours and cysts . . .		0·8	0·6	1·4	..	..	..	..	..	..	0·03	0·01	0·04
Poisons		0·1	0·1	0·2	..	..	..	..	..	..	0·00	0·00	0·00
No appreciable disease . .		0·1	0·1	0·2	..	..	..	..	..	..	0·01	0·00	0·01
Suicides		..	..	..	..	..	..	..	..	..	..	..	..
Total .		240·8	163·8	404·6	1·05	0·62	1·67	1·93	1·93	3·87	9·13	6·21	15·33

APPENDIX XVI.

INDIAN OFFICERS AND INDIAN OTHER RANKS.
EASTERN COMMAND.

I. Pre-war period (January to August).
II. War period (September to December).
III. Whole year.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick, during the year 1939.

Diseases.	Admissions.			Deaths.			Invalids.			Constantly sick.		
	I	II	III	I	II	III	I	II	III	I	II	III
Specific diseases due to infection or infestation.												
Common cold	10·5	9·8	20·4	..	..	..	..	..	..	0·18	0·16	0·34
Diphtheria	..	..	..	..	..	..	..	..	..	..	..	..
Dysentery	11·0	8·2	19·2	0·04	..	0·04	..	..	..	0·39	0·32	0·71
Enteric fevers (inclusive of typhoid, para. A, B & C and enteric group)	0·4	0·2	0·6	0·04	0·08	0·12	..	..	..	0·04	0·03	0·07
Erysipelas	..	..	..	..	..	..	..	..	..	..	..	..
Influenza	2·2	1·8	4·0	..	..	..	..	..	..	0·05	0·04	0·09
Malaria	32·3	70·8	103·1	..	0·04	0·04	..	..	..	0·93	2·07	3·01
Measles	1·2	0·2	1·4	..	..	..	..	..	..	0·06	0·01	0·07
Meningococcal infection	0·1	0·2	0·3	..	0·08	0·08	..	..	..	0·02	0·01	0·03
Mumps	3·9	1·5	5·3	..	..	..	..	..	..	0·22	0·07	0·29
Pneumonia	3·9	2·1	6·1	0·31	0·08	0·39	0·04	..	0·04	0·28	0·13	0·42
Pyrexia of uncertain origin	0·1	..	0·1	..	..	..	..	..	..	0·00	..	0·00
Rheumatic fever	0·8	0·3	1·0	..	..	..	0·04	0·04	0·08	0·06	0·01	0·07
Sandfly fever	0·4	2·6	3·0	..	..	..	..	..	..	0·01	0·07	0·08
Scarlet fever	..	..	..	..	..	..	..	..	..	..	..	..
Smallpox	0·2	0·1	0·3	0·04	..	0·04	..	..	..	0·02	0·01	0·02
Tuberculosis { Pulmonary	1·7	0·5	2·2	..	0·04	0·04	1·47	0·54	2·01	0·24	0·08	0·32
Tuberculosis { Other	0·2	0·1	0·3	0·08	0·04	0·12	0·19	0·08	0·27	0·05	0·07	0·12

Venereal diseases	Gonorrhoea	1·9	2·9	4·7	..	..	..	..	..	..	0·20	0·28	0·48
	Soft chancre	0·5	0·7	1·1	..	..	..	..	..	..	0·03	0·05	0·08
	Syphilis	2·0	2·4	4·4	..	..	..	..	0·08	0·08	0·23	0·17	0·40
	Other V. D.	0·0	0·2	0·2	..	..	..	..	..	..	0·00	0·00	0·01
Other diseases due to infection		4·3	2·1	6·4	0·04	0·08	0·12	..	..	..	0·25	0·10	0·35
Diseases due to infestation by metazoan parasites	Scabies	6·2	6·9	13·1	..	..	..	..	..	..	0·21	0·23	0·44
	Other diseases	5·1	2·0	7·2	..	..	..	0·04	0·12	0·15	0·23	0·10	0·33
Other diseases classified under systems.													
Diseases of the nervous system		2·4	1·9	4·3	..	0·04	0·04	0·15	0·08	0·23	0·11	0·10	0·21
Mental diseases		0·5	0·6	1·1	0·04	..	0·04	0·31	0·15	0·46	0·06	0·06	0·12
Diseases of the :—													
Eye		11·6	6·4	18·0	..	..	..	0·46	0·04	0·50	0·43	0·24	0·67
Ear and nose		5·4	4·6	9·9	..	..	..	0·04	0·04	0·08	0·15	0·13	0·28
Circulatory system.	Valvular diseases of the heart.	0·0	..	0·0	..	..	..	0·04	..	0·04	0·01	..	0·01
	Disordered action of the heart.	0·3	0·2	0·5	0·04	0·04	0·08	..	..	..	0·01	0·02	0·03
	Other diseases	0·5	0·3	0·9	0·08	0·12	0·19	0·04	..	0·04	0·04	0·01	0·05
Blood and blood forming organs		3·3	1·7	5·0	..	..	..	0·04	..	0·04	0·20	0·09	0·29
Ductless or endocrine glands		0·2	0·1	0·3	..	..	..	..	..	..	0·01	0·00	0·01
Breast		..	..	..	..	..	..	..	..	..	..	..	..
Respiratory system.	Larynx and trachea	0·5	0·0	0·5	..	..	..	..	..	..	0·01	0·00	0·02
	Bronchi and bronchioles.	6·8	5·8	12·7	..	..	..	..	0·08	0·08	0·22	0·19	0·41
	Other diseases	1·3	0·5	1·9	0·04	..	0·04	0·08	0·15	0·23	0·14	0·03	0·18
Teeth and gums		1·7	1·0	2·7	..	..	..	..	..	..	0·04	0·02	0·06
Digestive system.	Inflammation of tonsils.	3·6	1·6	5·1	..	..	..	..	..	..	0·09	0·04	0·13
	Inflammation of pharynx.	9·1	4·2	13·3	..	..	..	..	..	..	0·17	0·08	0·25
	Inflammation of stomach.	0·9	0·5	1·4	..	..	..	..	..	..	0·03	0·01	0·04
	Gastric ulcer	..	..	..	..	..	..	..	..	..	..	..	..
	Duodenal ulcer	..	0·0	0·0	..	..	..	..	..	..	..	0·00	0·00
	Liver	0·9	0·8	1·8	..	..	..	..	..	..	0·05	0·06	0·10
	Other diseases	14·8	10·4	25·2	0·12	..	0·12	0·04	0·12	0·15	0·43	0·34	0·77

APPENDIX XVI—*contd.*

Diseases.	Admissions.			Deaths.			Invalids.			Constantly sick.		
	I	II	III	I	II	III	I	II	III	I	II	III
Other diseases classified under systems—contd.												
Diseases due to disorders of nutrition or of metabolism.	0·1	0·1	0·1	..	..	..	..	0·08	0·08	0·01	0·01	0·02
Diseases of the :—												
Generative system	1·2	1·2	2·1	..	..	..	0·04	..	0·04	0·07	0·04	0·11
Bones, joints, muscles, fasciae and bursae.	6·4	5·5	11·9	..	..	..	0·50	0·43	0·93	0·36	0·23	0·58
Areolar tissues	22·5	17·0	39·5	..	..	..	..	..	..	0·67	0·47	1·14
Skin	11·0	8·5	19·5	..	..	..	0·04	..	0·04	0·41	0·33	0·73
Urinary Organs	2·0	1·0	3·0	0·08	..	0·08	0·08	..	0·08	0·11	0·04	0·15
Injuries — General	0·2	0·1	0·4	0·15	0·19	0·35	..	..	..	0·01	0·00	0·01
Injuries — Local	38·7	22·5	61·1	0·08	..	0·08	0·74	0·46	1·20	1·75	0·90	2·65
Injuries — In action	..	..	..	..	..	..	..	..	..	..	..	..
Tumours and cysts	0·8	0·6	1·4	..	..	..	..	0·12	0·12	0·04	0·03	0·07
Poisons	0·1	0·1	0·2	0·04	..	0·04	..	..	..	0·01	0·00	0·01
No appreciable disease	0·7	0·4	1·0	..	..	..	..	..	..	0·01	0·01	0·02
Suicides*	..	0·0	0·0	..	0·04	0·04	..	..	..	..	0·00	0·00
Total	236·7	213·6	450·3	1·20	0·81	2·01	4·38	2·59	6·97	9·39	7·52	16·91

*The figures against "Suicides" having already been shown under the heading of the injury, etc., which caused death, are not included in the total.

APPENDIX XVII.

INDIAN OFFICERS AND INDIAN OTHER RANKS.
SOUTHERN COMMAND.

I Pre-war period (January to August).
II War period (September to December).
III Whole year.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick, during the year 1939.

Diseases.	Admissions.			Deaths.			Invalids.			Constantly sick.		
	I	II	III	I	II	III	I	II	III	I	II	III
Specific diseases due to infection or infestation												
Common cold	5·6	9·9	15·5	..	..	..	..	..	..	0·09	0·19	0·28
Diphtheria	..	0·1	0·1	..	..	..	..	..	..	..	0·00	0·00
Dysentery	11·5	7·6	19·1	0·05	..	0·05	..	..	..	0·40	0·27	0·67
Enteric fevers, (inclusive of typhoid, para. A. B. and C. and enteric group).	0·1	0·1	0·2	..	0·05	0·05	..	..	..	0·03	0·01	0·04
Erysipelas	..	..	..	..	..	..	..	..	..	..	..	..
Influenza	2·6	3·0	5·6	..	..	..	..	..	..	0·06	0·05	0·10
Malaria	42·4	75·0	117·4	..	0·05	0·05	0·05	..	0·05	1·12	1·86	2·98
Measles	0·2	..	0·2	..	..	..	..	..	..	0·01	..	0·01
Meningococcal infection	..	0·1	0·1	0·05	..	0·05	..	..	..	0·00	0·01	0·01
Mumps	1·4	1·6	3·1	..	..	..	..	..	..	0·08	0·10	0·18
Pneumonia	1·5	2·0	3·5	0·15	0·05	0·19	..	..	..	0·11	0·13	0·24
Pyrexia of uncertain origin	0·1	..	0·1	..	..	..	..	..	..	0·01	..	0·01
Rheumatic fever	0·3	0·4	0·7	..	..	..	..	0·05	0·05	0·04	0·02	0·06
Sandfly fever	0·1	0·1	0·3	..	..	..	..	..	..	0·01	0·00	0·01
Scarlet fever	..	..	..	..	..	..	..	..	..	..	..	..
Smallpox	..	..	..	..	..	..	..	..	..	..	..	..
Tuberculosis — Pulmonary	1·1	0·7	1·7	0·10	..	0·10	0·97	0·58	1·55	0·10	0·07	0·17
Tuberculosis — Other	0·2	0·2	0·5	0·05	..	0·05	0·19	0·15	0·34	0·03	0·02	0·05

APPENDIX XVII—*contd.*

Diseases.	Admissions.			Deaths.			Invalids.			Constantly sick.		
	I	II	III	I	II	III	I	II	III	I	II	III
Specific diseases due to infection—or infestation—contd.												
Venereal diseases: Gonorrhoea	2·7	2·8	5·5	..	..	..	0·10	..	0·10	0·20	0·19	0·39
Venereal diseases: Soft chancre	1·6	1·6	3·3	..	..	..	..	..	..	0·14	0·10	0·24
Venereal diseases: Syphilis	3·6	2·9	6·5	..	..	..	..	..	..	0·26	0·21	0·47
Venereal diseases: Other V. D.	0·2	1·5	1·6	..	..	..	..	..	..	0·01	0·09	0·10
Other diseases due to infection	6·0	4·0	10·1	..	..	..	0·10	0·05	0·15	0·33	0·19	0·52
Diseases due to infestation by metazoan parasites: Scabies	7·3	9·0	16·3	..	..	..	..	..	..	0·24	0·26	0·50
Diseases due to infestation by metazoan parasites: Other diseases	5·4	2·8	8·3	..	..	..	..	..	..	0·31	0·15	0·46
Other diseases classified under systems.												
Diseases of the nervous system	2·2	2·7	4·9	0·19	..	0·19	0·29	0·39	0·68	0·11	0·10	0·21
Mental Diseases	0·8	1·1	1·8	..	..	..	0·24	0·19	0·44	0·05	0·07	0·12
Diseases of the eye	6·4	4·4	10·8	..	..	..	0·10	0·34	0·44	0·27	0·15	0·42
Diseases of the ear and nose	6·7	9·6	16·3	..	..	..	0·10	0·24	0·34	0·19	0·25	0·44
Diseases of the circulatory system: Valvular diseases of the heart.	0·1	0·1	0·2	..	..	..	0·10	..	0·10	0·01	0·00	0·01
Diseases of the circulatory system: Disordered action of the heart.	0·6	0·3	0·9	0·05	..	0·05	0·15	..	0·15	0·03	0·01	0·05
Diseases of the circulatory system: Other diseases	0·6	0·6	1·2	0·05	0·10	0·15	0·10	0·05	0·15	0·05	0·03	0·09
Diseases of the blood and blood forming organs.	3·1	2·2	5·3	..	..	..	..	0·05	0·05	0·16	0·13	0·30
Diseases of ductless or endocrine glands.	..	0·0	0·0	..	..	..	..	..	..	..	0·00	0·00
Diseases of the breast.	..	0·0	0·0	..	..	..	..	..	..	..	0·00	0·00
Diseases of the respiratory system: Larynx and trachea	0·1	0·2	0·3	..	..	..	..	..	..	0·01	0·01	0·01
Diseases of the respiratory system: Bronchi and bronchioles	8·3	6·7	15·0	..	..	..	0·19	0·05	0·24	0·30	0·21	0·51
Diseases of the respiratory system: Other diseases	1·2	1·4	2·6	0·05	..	0·05	0·05	0·15	0·19	0·13	0·06	0·19
Diseases of the teeth and gums	2·5	1·3	3·8	..	..	..	..	0·10	0·10	0·08	0·03	0·11

Diseases of the Digestive system.	Inflammation of tonsils.	4·0	2·1	6·1	..	..	..	..	..	..	0·08	0·04	0·12
	Inflammation of pharynx.	8·4	6·2	14·6	..	..	..	..	..	..	0·17	0·16	0·32
	Inflamation of stomach.	1·1	0·7	1·7	..	..	..	..	..	..	0·04	0·02	0·06
	Gasteric ulcer	0·1	0·3	0·4	0·05	..	0·05	..	0·24	0·24	0·01	0·03	0·04
	Duodenal ulcer	..	..	..	..	..	..	..	..	..	..	..	..
	Liver diseases	1·0	0·7	1·7	..	0·05	0·05	..	..	..	0·05	0·04	0·09
	Other diseases	15·3	13·5	28·8	0·05	0·10	0·15	0·29	0·24	0·53	0·55	0·45	1·00
Diseases due to disorders of nutrition or of metabolism.		0·2	0·1	0·3	..	..	..	0·15	0·05	0·19	0·03	0·01	0·04
Diseases of the generative system.		2·6	1·9	4·5	..	..	..	..	0·10	0·10	0·10	0·08	0·18
Diseases of bones, joints, muscles, etc.		7·7	6·1	13·8	..	..	..	0·49	0·29	0·78	0·34	0·21	0·55
Diseases of the areolar tissues		20·6	18·4	39·0	..	..	..	..	..	..	0·68	0·58	1·26
Diseases of the skin		6·9	10·2	17·2	0·05	..	0·05	0·15	0·05	0·19	0·30	0·37	0·68
Diseases of the urinary organs		1·4	0·7	2·1	..	..	..	0·05	0·10	0·15	0·08	0·03	0·11
Injuries	General	0·1	0·3	0·5	0·05	0·15	0·19	..	..	..	0·00	0·01	0·01
	Local	39·1	23·3	62·4	0·24	0·15	0·39	0·83	0·49	1·31	1·54	0·83	2·37
	In action	..	..	..	..	..	..	..	..	..	..	..	..
Tumours and cysts		1·0	0·7	1·7	..	..	..	0·10	0·05	0·15	0·04	0·06	0·09
Poisons		0·2	0·1	0·3	..	0·15	0·15	..	..	..	0·01	..	0·01
No appreciable disease		0·5	0·8	1·3	..	..	..	..	..	..	0·02	0·03	0·05
Suicides *		..	0·0	0·0	0·05	0·19	0·24	..	..	..	..	0·00	0·00
	Total	237·2	242·5	479·7	1·17	0·83	1·99	4·76	3·98	8·75	9·01	7·96	16·97

* The figures against "Suicides" having already been shown under the heading of the injury etc. which caused death, are not included in the total.

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY.

APPENDIX XVIII.

INDIAN OFFICERS AND INDIAN OTHER RANKS.

Table showing monthly ratios per 1,000 of strength of admissions for certain diseases for All-India during the year 1939.

Months.	Enteric group of fevers.	Influenza.	Cholera.	Small-pox.	Malaria.	Dysentery protozoal.	Dysentery bacillary.	Dysentery bacillary exudate.	Dysentery group.	Pyrexia of uncertain origin.	Pneumonia (lobar and lobular).	Diarrhœa.	Dengue.	Sandfly fever.	Plague.	Effects of heat.	All causes.
January	0·02	0·7	...	0·02	2·2	0·1	0·2	0·1	0·1	...	1·0	0·2	0·01	...	...	...	29·2
February	0·02	0·3	...	0·04	1·7	0·02	0·3	0·04	0·1	0·01	0·5	0·2	0·03	...	...	...	21·0
March	0·02	0·8	0·01	...	1·7	0·02	0·2	0·1	0·1	0·1	0·5	0·2	...	0·01	...	...	28·1
April	0·03	0·3	...	0·1	2·8	0·03	0·7	0·1	0·3	...	0·4	0·5	0·1	0·2	...	...	29·5
May	0·1	0·1	...	0·03	4·6	0·1	1·5	0·1	0·4	...	0·3	1·0	0·1	0·8	...	0·01	34·5
June	0·05	0·1	...	0·01	6·7	0·1	0·9	0·2	0·3	...	0·3	0·8	0 1	1·1	...	0·01	34·4
July	0·1	0·1	...	...	13·0	0·1	1·1	0·2	0·4	...	0·2	0·6	0·1	1·3	...	0·1	43·7
August	0·1	0·1	...	...	18·3	0·1	1·3	0·2	0·3	...	0·2	0·7	0·3	1·2	...	...	50·1
September	0·1	0·2	...	0·01	19·7	0·1	1·2	0·2	0·3	0·02	0·3	0·6	0·2	0·9	...	...	50·4
October	0·04	0·2	...	0·01	20·8	0·1	1·3	0·3	0·3	...	0·4	0·7	0·1	0·7	...	0·01	51·0
November	0·03	0·2	...	0·02	15·9	0·01	1 5	0·3	0·4	0·01	0·4	0·5	0·2	0·1	...	...	48·1
December	0·02	0·5	...	0·01	7·1	0.03	0.7	0·2	0·2	...	0·8	0·4	...	0·04	...	...	34·2
Total	0·6	3·7	0·01	0·2	117·3	0·6	11·2	2·1	3·1	0·1	5·3	6·3	1·1	6·0	..	0 2	451·8

APPENDIX XIX.

APPENDIX

INDIAN OFFICERS AND

Table showing ratios per 1,000 of strength of admissions for certain

Stations and Districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para. A.	Para. B.	Para. C.	Enteric group.	Bacillary.	Bacillary exudate.	Protozoal.	Clinical.
Chitral	..	..	..	..	..	..	..	..	..
Drosh Fort	..	..	..	..	..	..	..	..	2·4
Landikotal	..	0·5	..	..	..	5·4	1·0	..	2·0
Malakand	..	..	..	..	..	1·3	..	..	4·0
Mardan	..	..	..	..	..	5·0	..	..	2·0
Nowshera	..	0·6	..	..	1·6	6·5	..	..	2·2
Peshawar	0·2	..	..	..	..	23·2	0·9	..	4·1
Risalpur	..	..	..	..	..	4·7	2·4	..	1·2
Shagai	..	..	..	..	..	..	..	..	..
Total Peshawar Distt.	0·1	0·2	..	..	0·3	11·4	0·6	..	2·8
Fort Lockhart	..	..	..	..	..	..	..	..	..
Kohat	0·8	..	..	..	..	9·2	1·8	0·5	1·8
Thal	..	..	..	..	..	12·9	5·3	..	0·8
Total Kohat District	0·5	..	..	..	..	9·5	2·5	0·4	1·4
Abbottabad	0·3	..	0·3	..	0·7	3·9	0·7	..	0·3
Campbellpore	..	..	..	..	..	..	..	..	..
Jhelum	..	0·4	..	..	..	6·5	1·2	0·4	4·4
Kalabagh	..	..	..	..	..	..	12·7	..	..
Kuldana	..	..	..	..	..	7·1	..	..	..
Mona	..	..	..	..	..	..	..	..	..
Rawalpindi	..	0·2	..	..	..	20·1	4·0	1·7	0·2
Sargodha	..	..	..	..	..	..	..	..	..
Total Rawalpindi District	0·1	0·2	0·1	..	0·2	11·2	2·3	0·8	1·3
Ambala	..	..	..	..	0·4	7·5	2·9	2·9	2·9
Amritsar	..	..	..	..	..	7·9	..	..	..
Bakloh	..	2·1	..	..	..	..	..	..	2·1
Dagshai	..	..	..	..	..	..	..	..	..
Dalhousie	..	..	..	..	..	..	..	..	..
Dharamsala	..	..	..	..	2·7	1·3	..	..	1·3
Ferozepore	..	..	..	..	..	2·3	5·6	..	4·5
Jullundur	1·5	..	..	..	..	1·5	2·9	..	5·1
Jutogh	..	..	..	..	..	..	..	..	..
Lahore	0·4	..	..	..	..	4·4	4·4	0·4	3·2
Multan	1·9	..	..	..	..	13·0	7·4	..	11·1
Sialkot	1·7	..	..	..	..	4·7	4·1	..	2·9
Total Lahore District	0·6	0·1	..	..	0·3	4·4	3·6	0·7	3·6

XIX.

INDIAN OTHER RANKS.

diseases in each station and District in India during the year 1939.

Diarrhœa.	Cholera.	Venereal diseases.	Smallpox.	Malaria.	Dengue.	Sandfly fever.	Common cold.	Influenza.	Pneumonia, lobar and lobular.	Heat-stroke.	Heat-exhaustion.	All causes.	Constantly sick.
15·9	..	..	..	23·8	..	7·9	..	..	..	..	..	246·0	6·90
1·2	..	1·2	2·4	44·1	..	2·4	20·3	..	2·4	..	..	306·3	7·56
5·4	..	0·5	0·5	123·7	..	11·2	3 9	3·9	4·9	..	..	344·7	10·57
..	..	2·7	1·3	100·8	..	9·4	8·1	..	1·3	..	..	272·8	6·61
4·0	..	9·9	..	93·3	..	5·0	7·0	..	6·0	..	..	335·0	9·31
12·1	..	2·8	..	69·7	..	23·0	37·3	8·1	3·1	..	3·1	475·9	12·47
4·7	..	4·7	0·2	70·3	..	14·9	11·9	..	4·5	..	0·9	329·1	14·08
..	..	3·6	..	53·3	..	3·6	2·4	..	7·1	..	..	246·2	6·95
11·2	..	3·2	..	79·9	..	..	17·6	..	3·2	..	..	332·3	8·95
6·0	..	3·5	0·3	78·1	..	13·2	15·8	2·3	4·1	..	1·0	353·8	11·53
..	..	..	..	272·7	..	..	8·5	..	..	..	..	491·5	11·25
19·5	..	2·3	0·3	106·8	..	6·2	1 5	..	4·1	..	0·3	419·5	16·76
1·5	..	6·1	..	225·3	..	36·5	..	..	6·8	..	..	455·1	10·45
14·0	..	3·1	0·2	145·3	..	12·9	1·6	..	4·5	..	0·2	432·5	14·92
3·3	..	4·6	0·7	122·2	..	1·0	10·3	3·9	4·9	..	..	464·2	14·16
..	..	..	..	54·1	..	..	27·0	..	..	..	..	202·7	3·78
2·0	..	6·9	..	127·1	0·8	2·8	4·8	0·4	6·9	..	..	264·1	8·26
..	..	..	..	189·9	..	..	12·7	12·7	..	..	..	417·7	15·57
..	..	..	..	50·0	..	..	..	..	7·1	..	..	371·4	30·43
..	..	..	..	..	..	..	..	..	22·2	..	..	755·6	19·56
4·5	..	10·9	..	103·0	..	6·4	14·0	4·7	10·4	..	0·5	433·6	19·60
..	..	..	..	209·3	..	..	..	..	...	..	..	558·1	10·00
3·4	..	7·6	0·2	114·3	0·2	3·6	10·5	3·4	7·7	..	0·2	400·7	15·15
7·5	..	5·9	1·7	155·6	0·4	..	10·9	..	7·5	..	..	557·9	16·74
..	..	31·7	..	55·6	..	..	23·8	..	..	..	..	357·1	12·14
2·1	..	14·9	..	138·3	..	..	10·6	4·3	17·0	..	..	497·9	22·47
..	..	..	..	43·5	..	..	..	..	..	..	..	260·9	25·22
..	..	..	..	..	..	..	..	..	..	..	..	..	59·09
5·3	..	2·7	..	165·1	..	..	10·7	..	8·0	..	..	466·0	16·17
0·6	..	10·2	..	59·3	..	1·1	1·1	6·8	4·5	..	..	371·3	14·11
4·4	..	11·0	..	46·7	..	..	34·3	..	11·0	..	..	480·6	15·33
8·8	..	..	..	8·8	..	..	17·5	..	..	..	..	193·0	5·00
10·8	..	4·4	..	145·3	..	2·4	8·8	11·6	7·6	..	..	472·2	16·15
..	..	7·4	..	371·1	..	..	..	..	3·7	..	..	586·3	15·99
7·0	..	8·1	..	47·7	..	..	7·0	1·2	5·2	..	..	359·1	15·19
5·9	..	7·6	0·3	117·4	0·1	0·7	10·8	3·8	7·2	..	..	459·9	15·88

APPENDIX.

Stations and Districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para. A.	Para. B.	Para. C.	Enteric group.	Bacillary.	Bacillary exudate.	Protozoal.	Clinical.
Bannu	..	0·3	..	..	..	15·9	4·0	0·3	4·0
D. I. Khan	..	..	..	..	..	11·0	5·5	..	5·5
Mari Indus	..	..	..	..	5·3	10·6	..	..	..
Manzai	..	..	..	..	..	9·5	7·1	..	1·2
Razmak	..	0·2	..	..	0·2	22·8	2·2	0·2	5·6
Wana	..	..	..	..	0·2	2·0	0 5	..	0·2
Mirali	..	..	..	..	..	6·8	2·4	1·0	2·4
Total Waziristan District	..	0·1	..	..	0·2	13·4	2·4	0·2	3·3
Chaman	..	..	..	..	0·8	19·1	7·2	..	..
Quetta	..	..	..	..	0·2	11·9	1·9	0·5	1·2
Fort Sandeman	..	0·5	..	..	1·4	0·9	0·5	0·9	0 9
Hindubagh	..	..	..	..	..	..	..	..	..
Loralai	1·9	1·0	..	..	1·0	2·9	..	..	..
Hyderabad	..	1·3	..	..	1 3	9·4	1·3	..	45·5
Karachi	1·2	..	..	..	..	8·8	2·4	..	2·9
Total Western (I) District	0·4	0·3	..	..	0·6	8·9	2·0	0·4	4 1
Bareilly	..	..	..	..	..	11·1	1·6	2·6	1·6
Dehra Dun	1·1	..	..	..	0·4	6·2	1·8	3·3	4·4
Jhansi	..	..	..	..	0·3	33·0	1·7	0·3	0·3
Landsdowne	0·8	0·8	..	..	..	4·7	0·8	..	5·4
Meerut	..	..	..	..	0·9	8·5	1·3	..	4·5
Nowgong	..	..	..	..	..	..	..	..	..
Roorkee	..	..	..	..	..	4·0	..	..	3·4
Total Meerut District	0·3	0·1	..	..	0·3	13·1	1·3	1·2	3·0
Almora	1·5	1·5	..	..	..	7·4	5·9	4·5	3·0
Allahabad	..	..	..	..	..	15·8	1·1	..	3.4
Benares	..	..	..	..	..	..	..	..	..
Cawnpore	..	..	..	..	.	..	..	..	..
Fatehgarh	..	..	..	..	.	2·6	1·3	1·3	9·3
Fyzabad	..	..	..	..	..	..	..	..	4·2
Gorakhpur (Kuraghat)	..	..	..	..	..	..	..	..	..
Lucknow	0·9	..	..	..	0·5	20·0	5·5	2·7	5·0
Total Lucknow District	0·6	0·2	..	..	0·2	13·0	3·6	2·0	4·8
Allpore	0·8	..	..	..	0·8	16·0	2·5	0·8	0.8
Dinapore	..	..	..	..	..	..	..	..	..
Ghoom	..	..	..	..	..	12·7	..	..	..
Gyantse	..	..	..	..	..	..	..	..	..
Shillong	0·6	..	..	..	..	6·5	1·8	1·8	7·0
Chittagong	..	..	..	..	..	..	..	..	..
Comilla	..	..	..	..	..	..	..	..	..
Dacca	..	..	..	..	..	5·4	..	..	8·9
Midnapore	..	..	..	..	..	15·1	4·3	..	4·3
Saidpur	..	..	..	..	..	26·3	..	..	8·8
Total P. & A. District	0·4	..	..	..	0·2	9·1	1·7	0·8	4·3
Agra	..	..	..	..	..	25·5	1·1	..	2·2
Delhi	..	..	..	..	..	9·9	..	0·7	2·8
Muttra	1·5	..	..	..	..	16·2	1·5	1·5	..
Total Delhi Bde. Area	0·3	..	..	..	..	16·0	0·7	0·7	2·0

XIX—*contd.*

Diarrhœa.	Cholera.	Venereal diseases.	Smallpox.	Malaria.	Dengue.	Sandfly fever.	Common cold.	Influenza.	Pneumonia, lobar and lobular.	Heat-stroke.	Heat-exhaustion.	All Causes.	Constantly sick.
8·8	..	7·9	..	159·4	..	7·4	25·2	..	8·2	..	..	607·5	22·90
5·5	..	11 0	5·5	248·6	..	..	..	..	5·5	..	..	613·3	16·24
5·3	..	10 6	.	206·3	..	26·5	..	..	21·2	..	..	566·1	16·67
20·2	..	3·6	..	84·5	..	3·6	6·0	1·2	2·4	..	..	351·2	11·44
3·6	..	4·0	0·2	190·5	..	2·2	3·5	1·2	3·0	..	..	652·0	24·94
5·4	..	1·2	0·2	83·4	..	0 7	14·1	19·5	5·4	..	.	360·0	15·83
5·8	..	2·4	0·5	291·3	..	47·3	21·7	0·5	4·8	..	..	812·1	14·65
6·3	..	4·1	0·2	166·0	..	8·7	12·9	5·3	5·1	..	..	575·4	20·20
3 2	..	6·4	..	113·8	..	..	14·3	..	5·6	..	..	370·7	15·12
7·6	..	7·1	..	118·3	..	18·1	5·7	..	5·7	..	..	357·1	19·44
2·8	..	2·8	..	199·3	..	17·1	58·7	0·9	4·6	..	..	531·7	15·14
25·4	..	8·5	..	59·3	.	33 9		.	..	..	..	326·3	7·16
5·8	..	3·8	..	87·2	.	33·6	26·8	..	2·9	..	..	316·4	8·65
10·7	..	10·7	..	170·0	..	1·3	10·7	9·4	2·7	..	..	527·4	15·37
7·1	..	2·4	..	42·9	..	0·6	50·6	..	8·8	..	..	395·1	10·78
6·5	..	5·5	..	121·3	..	13·9	25·6	0·8	5·4	..	..	404·4	15·33
4·2	..	12·7	..	98·3	..	..	12·2	..	3·2	..	..	321·4	14·14
11·0	..	7·7	..	176·4	..	..	23·7	13·5	5·5	..	..	682·6	25·09
5·6	..	3·3	0·3	99·4	..	2·6	36·3	10·2	3·0	..	..	513·0	18·22
6·2	..	3·9	..	162·9	..	..	70·6	0·8	6·2	..	..	567·9	19·69
8·9	..	13·0	0·9	174·5	..	..	8·9	..	6·3	..	..	507·4	19·67
13·0	..	..	..	129·9	..	..	13·0	..	..	..	..	584·4	14·55
7·4	..	4·6	..	88·2	..	..	10·2	..	6·3	..	..	404·7	11·86
7·5	..	7·5	0·2	133·3	..	0·6	25·2	5·3	4·8	..	..	511·1	18·59
13·4	..	13·4	..	188 7	..	..	..	1·5	7·4	..	..	414·6	17·24
9·0	..	20·4	..	100·7	..	7·9	5·7	..	3·4	..	..	495·5	17·66
..	..	..	..	..	..	..	..	..	..	..	..	83·3	17·50
..	..	..	..	58·8	..	39·2	39·2	..	..	..	..	411·8	15·88
21·2	1·3	11·9	1·3	84·7	..	..	10·6	..	4·0	..	..	472·2	15·83
..	..	4·2	..	96·6	..	..	12·6	..	29·4	..	..	365·5	15·67
..	..	16·4	..	726·8	..	..	..	5·5		..	..	1082·8	27·16
7·7	..	15·0	..	30·9	..	25·0	18·6	..	7·3	..	.	488·0	20·29
10·0	0·2	14·6	0·2	101·4	..	12·8	11·8	0·4	6·8	..	..	491 2	18·72
1·7	..	8·4	1·7	24·5	28·7	..	59·9	9·3	5·1	..	..	424·1	23·30
..	..	..	..	71.4	..	..		..	..	..	..	285·7	3·57
..	..	12·7	..	63·3	..	..	25·3	..	..	..	..	316·5	14·68
..	..		..	11 4	..	..	34·1	..	22·7	..	..	204·5	19·66
5·3	..	18·2	..	103·2	..	..	12·3	1 8	11·7	..	..	363·0	17·01
..	..	18·2	..	78 1	..	..	15·6	23·4	13·0	..	..	372·4	12·40
.	..	23·6	..	18·9	..	..	14·2	..	4·7	..	..	495·3	11·18
1·8	..	10 7	1·8	32·1	21·4	..	3·6	1 8	3 6	..	..	248·2	6·62
2·2	..	21·6		73·3	2·2	..	6·5	..	10·8	..	..	319·0	8 43
..	..	26·3	.	..	..	..	..	..	..	..	..	359·6	11·67
2·7	.	15·1	0·6	61·5	9·7	.	22·9	5·0	8·5		..	359·9	15·61
..	..	8·9	..	31·1	..	5·5	15·5	7·8	3·3	..	..	165·4	5·84
5 0	..	7·1	..	40·3	..	..	5·7	1·4	6·4	..	..	338 3	10·42
5·9	..	11·8	..	56·0	..	..	10·3	..	10·3	..	..	308·3	13·45
3·7	..	8·7	..	41·1	..	1·7	9·7	3·0	6·4	..	..	279·4	9·73

APPENIX

Stations and Districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para. A.	Para. B.	Para. C.	Enteric group.	Bacillary.	Bacillary exudate.	Protozoal.	Clinical.
Ahmednagar	..	..	..	..	..	13·1	1·0	1·0	3·0
Aurangabad	2·4	..	..	..	..	4·8	4·8	..	14·4
Jubbulpore	..	..	..	..	..	20·3	3·5	0·5	2·5
Kamptee	..	..	..	..	..	1·9	7·7	..	..
Pachmarhi	..	..	..	..	..	3·6	3·6	..	..
Saugor	..	..	..	..	..	23·9	..	..	5·9
Secunderabad	0·6	..	..	..	..	15·1	0·9	0·3	9·1
Total Deccan District	0·4	..	..	..	..	14·5	2·4	0·4	5·9
Belgaum	..	..	..	..	..	4·7	0·7	..	0·7
Poona	..	0·3	..	..	..	16·3	0·3	..	1·3
Total Poona Bde. Area	..	0·2	..	..	..	13·0	0·4	..	1·1
Ahmedabad	..	..	..	..	..	12·0	15·4	..	1·7
Baroda	..		..	..	..	6·6	3·3	..	..
Bombay	..	..	..	..	..	9·2	1·2	..	1·2
Deolali	..	..	..	..	..	..	3·4	..	..
Mhow	..	..	..	..	..	20·8	1·6	1·6	9·6
Mt. Abu	..	..	..	..	..	..	..	..	..
Nasirabad	..	..	..	..	2·4	17·7	2·4	2·4	2·4
Total Bombay District	..	..	..	..	0·5	12·2	4 2	0·8	2·6
Bangalore	..	..	..	..	..	8·3	3·4	0·8	1·9
Cannanore	..	..	..	..	..	7·0	..	..	..
Madras	..	..	..	..	..	24·2	5·6	1·9	9·3
Trichinopoly	..	..	..	..	..	..	..	11·0	..
Wellington	..	..	..	..	..	..	..	..	..
Total Madras District	..	..	..	..	..	10·1	3·1	1·0	2·6
Total All-India	0·2	0·1	0·01	..	0·2	11·2	2·1	0·6	3·1

XIX—*concld.*

Diarrhœa.	Cholera.	Venereal diseases.	Smallpox.	Malaria.	Dengue.	Sandfly fever.	Common Cold.	Influenza.	Pneumonia, lobar and lobular.	Heat-stroke.	Heat-exhaustion.	All Causes.	Constantly sick.
2·0	..	21·1	..	52·3	..	1·0	2·0	..	..	..	1·0	255·5	9·28
7·2	..	4·8	..	95·9	..	..	7·2	26·4	7·2	..	..	491·6	16·86
4·6	..	13·9	...	160·8	..	1·5	2·0	..	3·5	..	..	639·4	23·66
9·6	..	15·4	..	163·5	..	..	21·2	9·6	5·8	..	..	644·2	18·63
7·2	..	3·6	..	188·4	..	..	..	..	..	..	..	311·6	6·63
11·8	..	5·9	..	242·6	..	..	..	..	..	..	..	443·8	11·01
5·0	..	18·5	..	34·2	0·3	..	13·2	5·0	1·3	..	..	376·3	13·56
5·0	..	15·8	...	98·1	0·1	0·5	8·2	4·2	2·2	..	0·1	454·4	15·91
2·0	..	20·7	..	68·9	..	..	72·3	12·0	2·7	..	..	510·0	17·20
4·5	..	21·8	..	178·2	..	..	10·5	..	4·5	..	..	511·6	19·09
3·8	..	21·5	..	147·3	..	..	28·0	3·4	4·0	..	..	511·1	18·55
..	..	13·7	..	179·8	..	..	6·8	..	1·7	..	..	359·6	11·04
10·0	..	10·0	..	237·5	..	..	..	16·6	3·3	..	..	511·6	13·84
4·6	..	17·3	..	384·3	..	..	39·1	20·7	5·8	..	..	720·1	22·50
6·9	..	20·7	..	75·9	..	..	..	..	..	..	..	344·8	11·45
6·4	..	14·4	..	187·2	..	1·6	..	8·0	8·0	..	..	625·6	21·02
..	..	..	..	52·6	..	..	..	..	..	..	..	808·4	5·79
1·2	..	8·2	..	61·2	..	1·2	25·9	24·7	7·1	..	..	447·6	19·74
4·4	..	13·3	..	201·7	..	0·5	15·6	14·1	5·0	..	..	528·1	17·63
11·3	..	20·4	..	20·8	29·5	..	12·1	0·4	2·6	..	..	414·2	17·67
8·7	..	7·0	..	28·0	3·5	..	21·0	1·7	7·0	..	..	455·3	14·04
1·9	..	0·3	..	14·9	..	..	..	16·7	1·9	..	..	342·0	14·13
..	..	..	..	22·0	11·0	..	..	..	..	..	..	263·7	687·4
..	..	..	..	..	..	..	..	..	..	..	..	76·9	6·15
9·3	..	16·3	..	21·0	21·0	..	11·4	2·8	3·1	..	..	402·6	16·33
6·3	0·01	8·4	0·2	117·3	1·1	6·0	15·6	3·7	5·3	..	0·2	451·8	16·23

APPENDIX XX.

INDIAN OFFICERS AND INDIAN OTHER RANKS.

Table showing admission and death ratios per 1,000 of strength by Commands contrasted with the previous year, and the average for the previous five years.

Commands.		Enteric group of fevers.		Influenza.		Cholera.		Smallpox.		Malaria.		Dysentery.	
		A.	D.	A.	D.	A	D.	A.	D.	A.	D.	A.	D.
Northern	1934-38	1·1	0·09	6·9	0·01	0·2	0·01	0·1	0·01	141·1	0·06	12·4	0·03
	1938	0·8	0·09	4·2	...	0·8	0·07	0·2		132·8	0·05	16·9	0·04
	1939	0·5	0·03	3·4	0·02	...	...	0·2	0·03	124·5	0·05	15·8	0·07
Western (I) Distt.	1934-38	1·3	0·05	3·3	0·02	...	...	0·1	...	153·8	0·10	13·9	0·06
	1938	1·1	...	0·1	...	...	...	...	...	87·2	0·09	18·8	...
	1939	1·0	0·09	0·8	...	...	...	...	...	121·5	...	15·1	...
Eastern	1934-38	1·2	0·10	5·4	0·01	0·02	0·01	0·3	0·02	103·1	0·08	12·8	0·03
	1938	0·5	0·12	1·3	...	...	...	0·3	0·04	92·3	0·08	16·5	0·04
	1939	0·6	0·12	4·0	...	0·04	...	0·3	0·04	103·1	0·04	19·2	0·04
Southern	1934-38	1·1	0·10	9·5	...	...	...	0·2	0·02	78·2	...	15·7	0·02
	1938	0·7	...	11·2	...	...	...	0·2	...	80·7	...	18·3	...
	1939	0·2	0·05	5·6	...	...	...	...	...	117·4	0·05	19·1	0·05
All-India	1934-38	1·1	0·09	6·9	0·01	0·1	0·01	0·2	0·01	123·5	0·06	15·1	0·03
	1938	0·8	0·07	4·4	...	0·4	0·04	0·2	0·01	109·7	0·05	17·2	0·03
	1939	0·5	0·06	3·7	0·01	0·01	...	0·2	0.03	118·3	0·04	17·1	0·04

Commands.		Pyroxia of uncertain origin.		Pneumonia, lobar and lobular.		Venereal diseases.		Dengue.		Sandfly fever.		Plague.	
		A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
Northern	1934-38	0·1	0·00	6·2	0·62	6·7	0·01	0·01	...	13·0	...	...	...
	1938	0·0	...	6·0	0·03	5·6	...	...	...	7·0	...	...	...
	1939	0·1	0·02	5·7	0·25	5·3	0·02	0·02	...	7·8	...	...	...
Western (I) Distt.	1934-38	0·02	...	4·1	0·39	5·2	...	0·02	...	5·3	...	...	...
	1938	...	...	2·8	0·27	6·5	...	...	...	5·7	...	...	...
	1939	0·1	...	5·4	0·44	5·5	...	...	...	13·7	...	...	...
Eastern	1934-38	0·03	...	5·8	0·44	12·1	...	3·8	...	2·1	...	...	...
	1938	0·0	...	5·8	0·23	9·0	...	0·1	...	2·2	...	...	...
	1939	0·1	...	6·1	0·39	10·5	...	1·8	...	3·0	...	...	...
Southern	1934-38	0·2	0·01	3·3	0·26	10·5	0·01	6·9	...	1·3	...	...	...
	1938	0·1	...	3·2	0·20	11·3	...	5·8	...	0·4	...	...	...
	1939	0·1	...	3·5	0·19	17·0	...	4·0	...	0·3	...	...	...
All-India	1934-38	0·1	0·01	5·3	0·48	9·1	0·01	2·8	...	7·5	...	...	...
	1938	0·0	...	3·0	0·43	7·5	0·00	1·1	...	4·6	...	...	...
	1939	0·1	0·03	5·4	0·20	8·5	0·01	1·1	...	6·0	...	...	...

A—Admission.
D—Death.

APPENDIX XXI.

BRITISH OFFICERS OF THE INDIAN ARMY.

I Pre-war period (January to August).
II War period (September to December).
III Whole year.

Table showing ratios per 1,000 of the strength of admissions, deaths, invalids and constantly sick, during the year 1939.

Diseases.	Admissions.			Deaths.			Invalids.			Constantly sick.		
	I	II	III	I	II	III	I	II	III	I	II	III
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.												
Common cold	6·5	3·1	9·7	..	..	..	0·51	..	0·51	0·16	0·03	0·19
Diphtheria	..	1·5	1·5	..	..	..	..	..	..	..	0·15	0·15
Dysentery	12·8	6·1	18·9	..	..	..	..	..	..	0·49	0·24	0·74
Enteric fevers (inclusive of typhoid, para. A, B and C and enteric group)	1·0	1·0	2·0	..	..	..	..	..	..	0·16	0·15	0·31
Erysipelas	..	..	..	..	..	..	..	..	..	..	..	..
Influenza	6·1	8·2	14·3	..	..	..	..	..	..	0·12	0·21	0·33
Malaria	18·9	26·6	45·5	..	..	..	..	..	..	0·53	0·80	1·33
Measles	..	0·5	0·5	..	..	..	..	..	..	..	0·02	0·02
Meningococcal infection	..	0·5	0·5	..	..	..	..	..	..	..	0·02	0·02
Mumps	6·6	..	6·6	..	..	..	..	..	..	0·16	..	0·16
Pneumonia	3·6	1·0	4·6	0·51	..	0·51	..	..	..	0·29	0·02	0·31
Pyrexia of uncertain origin	1·0	..	1·0	..	..	..	..	..	..	0·04	..	0·04
Rheumatic fever	0·5	..	0·5	..	..	..	..	..	..	0·17	..	0·17
Sandfly fever	14·8	12·3	27·1	..	..	..	..	..	..	0·19	0·22	0·42
Scarlet fever	..	0·5	0·5	..	..	..	..	..	..	..	0·03	0·03
Smallpox	..	..	..	..	..	..	..	..	..	0·02	..	0·02
Tuberculosis — Pulmonary	1·0	1·0	2·1	..	..	..	0·51	..	0·51	0·02	0·02	0·05
Tuberculosis — Other	2·0	0·5	2·5	..	..	..	..	..	..	0·00	0·01	0·02

Venereal	Gonorrhoea	..	..	..	..	..	..	..	..	..	..	..	..
	Soft chancre	..	..	..	..	..	..	..	..	..	..	..	..
	Syphilis	0·5	0·5	1·0	..	..	..	..	..	..	0·02	0·06	0·08
	Other V. D.	..	..	..	..	..	..	..	..	..	..	..	..
Other diseases due to infection		16·9	8·7	25·5	..	..	..	..	..	..	0·66	0·29	0·95
Diseases due to infestation by metazoan parasites.	Scabies	..	..	..	..	..	..	..	..	..	..	..	..
	Other diseases	4·1	1·0	5·1	..	..	..	..	..	..	0·08	0·01	0·09
OTHER DISEASES CLASSIFIED UNDER SYSTEMS.													
Diseases of the nervous system		8·7	6·6	15·4	..	0·51	0·51	1·02	..	1·02	0·51	0·19	0·70
Mental diseases		4·1	1·5	5·6	..	..	..	1·54	0·51	2·05	0·19	0·15	0·35
Diseases of the—													
Eye		..	1·0	1·0	..	..	..	..	..	..	..	0·08	0·08
Ear and nose		14·3	10·7	25·1	..	..	..	..	..	..	0·33	0·20	0·53
Circulatory system.	Valvular disease of the heart.	0·5	0·5	1·0	..	0·51	0·51	..	..	..	0·00	0·05	0·06
	Disordered action of the heart.	0·5	1·0	1·5	..	..	..	..	..	..	0·00	0·05	0·06
	Other diseases	3·1	1·5	4·6	..	..	..	0·51	0·51	1·02	0·05	0·08	0·13
Blood and blood forming organs		1·5	1·5	3·1	..	..	..	..	..	..	0·05	0·08	0·13
Ductless or endocrine glands		..	..	..	..	..	..	..	..	..	..	..	..
Breast		..	..	..	..	..	..	..	..	..	..	..	..
Respiratory system.	Larynx and trachea	1·0	1·0	2·0	..	..	..	..	..	..	0·01	0·01	0·03
	Bronchi and bronchioles.	6·1	4·6	10·7	..	..	..	0·51	..	0·51	0·14	0·12	0·27
	Other diseases	2·0	0·5	2·6	..	..	..	..	..	..	0·09	0·01	0·10
Teeth and gums		2·0	1·5	3·6	..	..	..	..	..	..	0·02	0·02	0·05
Digestive system.	Inflammation of tonsils.	15·4	9·2	24·6	..	..	..	..	..	..	0·31	0·21	0·52
	Inflammation of pharynx.	12·8	8·2	21·0	..	..	..	..	..	..	0·25	0·15	0·40
	Inflammation of stomach.	8·7	3·1	11·3	..	..	..	..	..	..	0·16	0·08	0·25
	Gastric ulcer	0·5	1·0	1·5	..	..	..	0·51	..	0·51	0·11	0·06	0·17
	Duodenal ulcer	0·5	1·5	2·0	..	..	..	..	..	..	0·07	0·08	0·15
	Liver	7·2	4·6	11·8	..	..	..	..	..	..	0·20	0·20	0·40
	Other diseases	52·7	32·7	85·5	..	..	..	..	1·02	1·02	1·52	1·09	2·61

APPENDIX XXI—*contd.*

Diseases.	Admissions.			Deaths.			Invalids.			Constantly sick.		
	I	II	III	I	II	III	I	II	III	I	II	III
OTHER DISEASES CLASSIFIED UNDER SYSTEMS—*contd.*												
Diseases due to disorders of nutrition or of metabolism.	0·5	1·0	1·5	..	..	..	..	0·51	0·51	0·01	0·16	0·17
Diseases of the—												
Generative system . .	1·0	0·5	1·5	..	..	..	..	..	..	0·04	0·01	0·06
Bones, joints, muscles, fasciae and bursae.	9·7	8·2	17·9	..	..	..	0·51	..	0·51	0·24	0·25	0·49
Areolar tissues . . .	17·4	12·3	29·7	..	..	..	..	..	..	0·47	0·49	0·96
Skin	7·7	4·6	12·3	..	..	..	0·51	..	0·51	0·25	0·16	0·40
Urinary organs . . .	6·6	5·6	12·3	0·51	..	0·51	..	..	..	0·24	0·27	0·51
Injuries { General . .	1·5	1·5	3·1	0·51	..	0·51	..	..	..	0·05	0·03	0·08
Injuries { Local . . .	39·4	28·6	68·1	1·54	..	1·54	0·51	1·02	1·54	1·28	1·12	2·40
Injuries { In action. . .	..	0·5	0·5	..	..	..	..	..	..	..	0·02	0·02
Tumours and cysts . . .	1·0	..	1·0	0·51	..	0·51	..	0·51	0·51	0·04	0·08	0·12
Poisons	..	..	..	..	..	..	..	..	..	..	..	..
No appreciable disease . .	0·5	2·6	3·1	..	..	..	..	..	..	0·01	0·07	0·08
Suicides	..	..	..	..	..	..	..	..	..	..	..	..
Total .	323·4	231·3	554·8	3·58	1·02	4·61	6·65	4·09	10·75	9·81	7·90	17·71

APPENDIX XXII.

DETAIL OF DISEASES.

RATIOS PER 1,000 OF THE STRENGTH.

Diseases.	British Troops.												Indian Troops.							
	British officers (B. S.)			B. O. Rs.				B. O. Rs. Wives.		B. O. Rs. Children.			British officers (I. S.)			V. C. Os and I. O. Rs.				
	A.	D.	Invalids.	A.	Average constantly sick.	D.	Invalids.	A.	D.	A.	D.		A.	D.	Invalids.	A.	D.	Invalids.	Average constantly sick	
Diseases caused by infection or infestation.																				
Anthrax	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	
Blackwater fever	...	...	...	...	...	...	...	...	...	...	...		...	...	...	0·0	0·01	...	0·00	
Chickenpox	2·1	...	...	0·2	0·02	...	...	...	...	1·5	...		1·3	...	...	1·3	...	...	0·08	
Common cold	8·5	...	...	11·2	0·20	...	...	2·8	...	6·1	...		8·1	...	0·43	15·7	...	...	0·28	
Cholera	...	...	...	...	...	...	...	...	...	...	...		...	...	...	0·0	...	...	0·00	
Cowpox	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	
Dengue	5·3	...	...	9·6	0·22	...	...	2·2	...	3·0	...		3·4	...	...	1·1	...	...	0·02	
Diphtheria	5·3	...	0·53	1·8	0·20	...	...	1·4	...	6·6	0·38		1·3	...	...	0·0	...	...	0·00	
Dysentery :—																				
Protozoal	5·9	...	...	2·6	0·23	...	0·06	0·6	...	1·3	...		2·1	...	...	0·6	...	...	0·05	
Bacillary	24·0	...	...	17·9	0·75	0·03	0·06	10·3	...	26·8	0·76		9·4	...	...	11·3	0·03	...	0·40	
Bacillary exudate	4·3	...	...	3·2	0·13	0·03	...	0·6	...	5·1	0·19		1·3	...	...	2·0	...	...	0·07	
Clinical	2·7	...	...	5·3	0·20	...	...	2·8	...	9·1	0·19		3·0	...	...	3·2	0·02	...	0·10	
Encephalitis (lethargica)	...	...	...	...	0·01	...	...	...	...	...	...		...	...	...	0·0	...	0·02	0·00	
Enteric fevers—																				
Typhoid fever	0·5	...	...	0·4	0·07	0·03	...	0·8	0·28	1·3	...		0·9	...	...	0·2	0·04	...	0·03	
Paratyphoid "A."	...	...	...	0·2	0·03	...	...	0·3	...	0·2	...		0·4	...	...	0·1	...	...	0·02	
Paratyphoid "B."	...	...	...	0·1	0·00	0·03	...	...	...	...	...		...	...	...	0·0	...	...	0·00	
Paratyphoid "C."	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	
Enteric group	1·1	...	0·53	0·4	0·06	...	...	...	...	0·4	...		0·4	...	...	0·2	0·02	...	0·02	
Enteritis infective, (including food poisoning)	...	...	...	0·1	0·00	...	...	...	...	...	...		0·4	...	...	...	...	...	...	
Erysipelas	0·5	...	...	0·0	0·00	...	...	0·3	...	...	...		...	...	...	0·0	...	...	0·00	
Gangrene, acute infective	...	...	...	0·0	0·01	...	...	...	...	...	...		...	...	...	0·0	...	...	0·00	
Hydrophobia (Rabies)	...	...	...	0·1	0·00	0·08	...	...	...	...	...		...	...	...	0·0	0·03	...	0·00	
Influenza	7·5	...	0·53	9·3	0·26	...	...	0·6	...	4·7	...		11·9	...	...	3·7	0·01	...	0·09	
Jaundice epidemic catarrhal	26·6	...	...	6·3	0·32	...	...	1·4	...	6·4	...		13·6	...	...	2·8	...	...	0.14	

APPENDIX XXII—*contd.*

Diseases.	British Troops.											Indian Troops.						
	British officers (B. S.).			B. O. Rs.				B. O. Rs. Wives.		B. O. Rs. Children.		British officers (I. S.).			V. C. Os and I. O. Rs.			
	A.	D.	Invalids.	A.	Average constantly sick.	D.	Invalids.	A.	D.	A.	D.	A.	D.	Invalids.	A.	D.	Invalids.	Average constantly sick.
Jaundice spirochætal	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Leishmaniasis—																		
Kala-azar	0·5	...	...	0·1	0·02	...	...	...	...	...	...	...	...	...	0·5	0·03	0·03	0·08
Oriental sore	...	...	...	0·7	0·03	...	...	0·3	...	0·4	...	0·4	...	...	1·2	...	...	0·07
Leprosy	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·1	...	0·03	0·00
Malaria	36·8	...	1·07	58·1	2·32	0·11	0·03	21·3	...	19·9	0·19	37·9	...	...	118·3	0·04	0·02	2·96
Measles	1·1	...	...	0·3	0·01	...	0.03	0·8	...	2·3	...	0·4	...	...	1·3	...	...	0·06
Meningococcal infection (cerebro-spinal fever)	...	...	...	0·1	0·01	0·03	...	...	...	...	...	0·4	...	...	0·2	0·04	0·01	0·03
Mumps	1·1	...	...	0·2	0·01	...	...	...	...	1·3	...	5·5	...	...	7·0	...	...	0·37
Poliomyelitis	0·5	...	...	...	...	...	...	0·3	...	0·2	...	...	...	...	0·0	0·01	...	0·01
Plague	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pyæmia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·02	...	0·00
Pyrexia of uncertain origin	0·5	...	...	0·2	0·02	...	...	...	...	0·2	...	0·9	...	...	0·1	0·01	...	0·01
Relapsing fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·00
Rheumatic fever	...	...	0·53	1·7	0·20	...	0·06	1·1	...	0·6	...	0·4	...	...	0·7	...	0·04	0·05
Rubella (German measles)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·1	...	...	0·00
Sandfly fever	25·1	...	...	30·7	0·62	...	...	3·9	...	0·9	...	22·6	...	...	6·0	...	...	0·11
Scarlet fever	...	...	...	...	...	...	...	...	...	1·3	...	0·4	...	...	...	...	...	...
Septicæmia	...	...	...	0·1	0·01	0·03	...	...	...	0·2	0·19	...	...	...	0·0	0·02	...	0·00
Smallpox	...	...	...	0·1	0·01	...	...	0·3	...	...	...	...	...	...	0·2	0·03	...	0·01
Tetanus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tuberculosis pulmonary	3·2	...	5·87	1·1	0·18	0·08	1·03	0·3	...	0·2	...	1·7	...	0·43	1·9	0·06	1·70	0·22
Tuberculosis other cases	...	...	...	0·2	0·03	0·03	0·14	...	...	1·5	...	2·1	...	...	0·3	0·04	0·22	0·07
Typhus fever	2·7	...	...	0·8	0·07	0·03	...	...	...	0·6	...	0·4	...	...	0·6	0·01	...	0·03
Undulent fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·1	...	...	0·02
Venereal diseases—																		
Gonorrhœa	...	...	...	32·7	2·42	...	0·03	...	...	0·2	...	...	...	...	3·4	...	0·02	0·28
Soft chancre	...	...	...	9·1	0·70	...	...	...	...	...	...	...	...	...	1·2	...	...	0·10
Syphilis	...	...	...	8·4	0·68	0·03	0·06	0·3	...	...	...	0·9	...	...	3·4	0·01	0·03	0·31
Other cases	...	...	...	2·8	0·16	...	...	...	...	...	...	...	...	...	0·6	...	...	0·04
Whooping-cough	...	...	...	...	...	...	...	...	...	2·3	0·38	...	...	...	...	...	...	...
Other diseases caused by infection	1·1	...	...	...	...	...	...	...	...	1·5	0·19	1·7	...	...	0·1	...	...	0·01

Diseases due to infestation by metazoan parasites.																			
Ankylostomiasis	...	...	...	0·2	0·01	...	...	0·3	...	...	...	0·4	...	...	6·2	...	...	0·27
Ascariasis	0·5	...	...	0·0	0·00	...	...	...	...	0·4	...	...	...	...	0·7	...	...	0·02
Bilharziasis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dracontiasis.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·6	...	0·03	0·10
Intestinal tæniasis—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tænia Solium	...	...	...	0·2	0·00	...	...	0·6	...	...	...	...	...	...	0·1	...	...	0·00
Tænia Saginata	...	...	...	1·6	0·03	...	...	2·5	...	2·6	...	3·0	...	...	0·3	...	...	0·01
Other intestinal parasites	...	...	...	0·1	0·01	...	0·03	...	...	...	...	0·9	...	...	0·1	...	...	0·00
Pediculosis	...	...	...	0·4	0·01	...	...	...	...	...	...	...	...	...	0·0	...	0·01	0·00
Scabies	...	...	...	2·2	0·09	...	...	...	...	...	...	...	...	...	11·9	...	...	0·39
Other diseases due to infestation	...	...	...	0·5	0·01	...	...	...	...	0·8	...	...	...	...	0·1	...	...	0·00
Diseases of the nervous system.	...	...	...	0·0	0·00	...	...	...	...	...	...	...	...	...	0·0	...	...	0·00
Aphasia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·00
Cerebral hæmorrhage.	...	...	...	...	...	...	...	...	...	0·2	0·19	...	...	...	...	...	...	...
Chorea	...	...	...	0·1	0·01	...	...	...	...	0·9	...	...	...	...	...	...	...	...
Convulsions	...	...	...	0·0	0·01	...	...	...	...	1·5	0·19	...	...	...	0·0	...	0·01	0·00
N. Y. D. Convulsions	1·1	...	0·53	0·4	0·04	...	0·33	0·3	...	...	...	...	...	...	...	...	...	...
Diseases of the spinal cord	...	...	...	0·1	0·02	...	...	...	...	...	...	...	...	...	0·0	...	0·03	0·00
Epilepsy	...	...	...	0·1	0·01	...	0·14	0·3	...	0·4	...	...	...	...	0·4	...	0·20	0·02
Vertigo	1·1	...	...	0·6	0·02	...	...	0·3	...	...	...	1·3	...	...	0·2	...	...	0·01
Meningitis	...	...	...	0·1	0·01	0·03	...	...	...	0·6	0·57	...	...	...	0·1	0·04	·01	0·00
Headache	5·3	...	0·53	5·3	0·13	...	0·03	0·8	...	0·6	...	3·4	...	...	0·2	...	...	0·00
Neuralgia	0·5	...	...	0·4	0·01	...	...	0·3	...	...	...	...	...	...	0·3	...	...	0·01
Disseminated sclerosis	...	...	...	0·1	0·02	...	0·03	0·3	...	...	...	0·9	...	...	...	...	...	...
Neuritis	...	...	...	0·6	0·05	...	0·08	0·6	...	...	...	1·7	...	0·43	0·4	...	0·01	0·02
Poliomyelitis acute anterior	0·5	0·53	1·07	0·1	0·01	0·06	0·06	...	...	...	...	...	...	...	...	...	...	...
Paralysis	0·5	...	...	0·3	0·04	...	0·11	...	...	0·2	...	0·9	...	...	0·4	0·01	0·02	0·02
Migraine	...	...	...	0·2	0·00	...	...	0·3	...	...	...	...	...	...	0·1	...	...	0·00
Sciatica	0·5	...	...	0·7	0·05	...	0·06	0·3	...	...	...	1·3	...	...	1·2	...	0·05	0·07
Other diseases of the nervous system	0·5	...	...	0·9	0·07	0·08	0·14	...	...	0·8	0·38	3·4	0·43	0·43	0·6	0·05	0·05	0·03
Mental diseases.																			
Feeblemindedness	...	...	...	0·1	0·03	...	0·11	...	...	...	...	...	...	...	0·0	...	0·01	0·00
Hysteria	0·5	...	0·53	0·9	0·09	...	0·25	1·1	...	...	...	0·9	...	0·85	0·5	...	0·13	0·03
Involution (melancholia)	...	...	...	0·1	0·01	...	0·06	0·3	...	...	...	...	...	...	0 0	...	0·01	0·00
Mania	...	...	...	0·0	0·00	...	0·03	...	...	...	...	...	...	...	0·1	0·01	0·06	0·01
Mental deficiency	...	...	...	0·1	0·01	...	0·06	...	...	0·2	...	...	...	...	...	...	...	...
Neurasthenia	1·6	...	1·07	0·4	0·06	...	0·08	0·3	...	...	...	1·7	...	0·43	0·3	...	0·05	0·02
Schizophrenia (dementia præcox)	...	...	...	0·3	0·06	...	0·28	...	...	...	...	...	...	...	0·1	...	0·11	0·02
Other mental diseases	2·7	...	0·53	1·2	0·20	...	0·69	1·7	...	0·2	...	2·1	...	0·43	0·3	...	0·11	0·03
Diseases of the eye.																			
Amblyopia and amaurosis	...	...	...	0·0	0·00	...	0·06	...	...	...	...	...	...	...	0·1	...	0·01	0·00
Anomalies of refraction	...	...	...	0·2	0·01	...	0·03	...	...	...	...	...	...	...	0·1	...	0·09	0·01
Blepharitis	...	...	...	0·3	0·02	...	0·06	...	...	...	...	...	...	...	0 J	...	...	0·00
Conjunctivitis	0·5	...	...	2·2	0·07	...	...	0·8	...	7·4	...	...	...	...	7·2	...	...	0·23
Conjunctivitis granular (Trachoma)	...	...	...	0·1	0·00	...	0·03	...	...	...	...	...	...	...	2·1	...	0·01	0·09
Cataract	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·1	...	0·04	0·01
Glaucoma	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	0·01	0·00

APPENDIX XXII—*contd.*

Diseases.	British Troops.										Indian Troops.						
	British officers (B.S.)			B. O. Rs.			B. O. Rs. Wives.		R. O. Rs. Children.		British officers. (I. S.)			V. C. Os. and I. O. Rs.			
	A.	D.	Invalids.	A.	Average constantly sick.	D.	Invalids.	A.	D.	A.	D.	A.	D.	Invalids.	A.	D.	Invalids.	Average constantly sick.
***Diseases of the eye*—contd.**																		
Iritis	...	...	...	0·1	0·01	...	...	...	...	...	...	...	...	...	...	...	0·02	0·01
Keratitis	...	...	...	0·7	0·07	...	0·06	...	...	...	...	...	...	...	1·2	...	...	0·08
Retinitis	0·5	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	0·03	0·00
Other diseases of the eye	...	...	...	0·7	0·04	...	0·06	0·3	...	0·9	...	0·4	...	...	1·7	...	0·16	0·07
Diseases of the ear.																		
Inflammation of the external ear	2·1	...	...	6·4	0·15	...	...	...	...	1·3	...	1·7	...	...	1·1	...	0·02	0.03
Diseases of the middle ear	1·6	...	...	4·4	0·22	...	0·11	1·1	...	6·8	...	1·3	...	...	3·4	0·1	0·06	0·14
Furunculosis	2·1	...	...	2·6	0·06	...	...	...	...	0·6	...	0·9	...	...	0·6	...	...	0·01
Diseases of the mastoid process	...	...	...	0·2	0·03	...	0·06	0·3	...	1·5	...	...	...	...	0·1	...	...	0·01
Other diseases of the ear	...	...	...	...	...	...	...	...	...	...	...	0·9	...	...	0·1	...	0·01	0·00
Diseases of the nose.																		
Diseases of the mucous membrane	4·8	...	...	8·3	0·19	...	0·03	1·4	...	4·9	...	4·7	...	...	3·5	...	...	0·07
Diseases of the bone and cartilage	...	...	...	0·1	0·01	...	...	...	...	...	...	0·4	...	...	...	...	...	...
Sinusitis	5·3	...	...	2·8	0·10	...	...	0·3	...	0·2	...	7·2	...	...	0·4	...	0·01	0·01
Other diseases of the nose	3·7	...	...	3·3	0·11	...	...	0·6	...	...	...	3·4	...	...	0·1	...	...	0·00

Diseases of the circulatory system.																		
Diseases of the valves	0·5	...	...	0·4	0·05	0·03	0·28	1·4	...	0·2	0·19	0·4	...	...	0·1	0·01	0·05	0·01
Disordered action of the heart	0·5	...	...	2·9	0·15	0·06	0·14	1·7	...	0·2	...	1·3	...	...	0·4	0·04	0·04	0·02
Diseases of the blood vessels	2·1	...	0·53	1·7	0·10	0·06	0·17	...	...	...	...	3·4	...	0·85	0·5	0·06	0·03	0·03
Endocarditis	...	...	...	0·1	0·02	...	0·08	...	...	...	...	...	...	...	0·0	...	0·03	0·01
Myocarditis	0·5	...	...	0·1	0·02	...	0·03	...	...	0·2	...	...	...	...	0·0	0·01	...	0·00
Pericarditis	...	...	...	0·0	0·01	...	...	...	...	...	...	...	...	...	0·1	0·01	0·01	0·01
Other diseases of the circulatory system	...	...	...	0·1	0·01	0·06	0·03	0·6	0·28	...	...	0·9	0·43	...	0·0	0·03	...	0·00
Diseases of the blood and blood forming organs.																		
Anæmia primary	...	...	...	0·1	0·00	...	...	0·6	...	0·2	...	0·9	...	...	0·3	0·01	0·02	0·02
Anæmia pernicious	...	...	...	...	0·00	...	0·03	...	...	...	...	...	...	...	0·1	...	...	0·01
Anæmia secondary	...	...	...	0·5	0·04	...	...	3·3	...	0·9	...	0·9	...	...	2·2	...	0·02	0·15
Diseases of the spleen	...	...	...	0·1	0·01	...	0·03	...	...	...	...	...	...	...	0·6	0·01	0·02	0·02
Lymphadenitis	2·1	...	0·53	5·9	0·32	...	...	0·3	...	4·4	...	0·4	...	...	1·7	...	0·01	0·09
Lymphangitis	...	...	...	0·2	0·01	...	...	0·8	...	...	...	0·4	...	...	0·0	...	...	0·00
Other blood diseases	1·1	...	...	0·7	0·05	...	0·03	0·3	...	0·6	0·19	...	...	...	0·1	0·01	0·01	0·01
Diseases of glands of internal secretion.																		
Goitre	...	...	...	0·1	0·00	...	...	0·3	...	...	...	...	...	...	0·1	...	0·01	0·00
Hyperthyroidism	...	...	...	0·1	0·01	...	0·03	...	...	...	...	...	...	...	0·1	...	0·02	0·00
Other diseases	...	...	...	0·1	0·01	...	0·03	0·8	...	0·4	...	...	...	...	0·0	...	...	0·00
Diseases of the breast.																		
Mastitis	...	...	...	0·2	0·01	...	...	3·0	...	...	...	...	...	...	0·0	...	...	0·00
Other diseases	...	...	...	0·0	0·00	...	...	...	...	...	...	...	...	...	...	...	...	...
Diseases of the respiratory system.																		
Asthma	...	...	...	1·0	0·05	...	0·17	0·8	...	1·5	...	...	...	...	0·7	...	0·09	0·03
Bronchitis	5·3	...	1·07	18·2	0·64	...	0·08	4·7	...	16·5	...	9·0	...	0·43	13·2	0·01	0·04	0·42
Empyema	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·01	...	0·01
Laryngitis	2·7	...	...	0·6	0·01	...	...	...	...	0·9	...	0·4	...	...	0·8	...	...	0·03
Pleurisy	...	...	...	1·6	0·13	...	0·08	0·8	...	...	...	1·7	...	...	1·7	0·01	0·14	0·16
Pneumonia—																		
(*a*) Lobar	1·1	...	0·53	3·8	0·32	0·11	...	1·4	...	2·3	0·19	3·4	0·43	...	4·5	0·20	0·01	0·32
(*b*) Lobular (broncho-pneumonia)	1·6	0·53	0·53	0·9	0·06	0·03	...	0·3	...	7·8	1·51	0·4	...	...	0·9	0·09	...	0·07
Tracheitis	...	...	...	1·2	0·03	...	...	...	...	...	...	1·3	...	...	0·2	...	...	0·00
Other diseases	1·1	0·53	...	0·8	0·08	...	0·14	0·8	...	1·1	0·38	0·4	...	...	0·2	0·01	0·07	0·03

APPENDIX XXII—*contd.*

Diseases.	British Troops.										Indian Troops.					
	British officers (B.S).			B. O. Rs.				B. O. Rs. Wives.		B. O. Rs. Children.		British officers (I.S).			V. C. Os and I. O. Rs			
	A.	D.	Invalids.	A.	Average constantly sick.	D.	Invalids.	A.	D.	A.	D.	A.	D.	Invalids.	A.	D.	Invalids.	Average constantly sick.
Diseases of the teeth and gums.																		
Caries of the enamel, dentine and cementum.	1·1	...	...	0·5	0·01	...	...	0·8	...	2·5	...	1·7	...	...	0·7	...	...	0·02
Gingivitis	0·5	...	...	0·6	0·02	...	...	...	...	0·8	...	...	...	...	0·9	...	...	0·02
Pyorrhœa alveolaris	1·6	...	...	1·0	0·02	...	...	0·6	...	...	...	...	...	...	1·4	...	0·11	0·04
Other diseases	2·7	...	...	0·7	0·03	...	...	0·3	...	2·3	...	1·3	...	...	0·4	...	...	0·01
Diseases of the digestive system.																		
Appendicitis	6·9	...	...	8·0	0·52	0·11	...	5·0	...	3·4	...	14·9	...	...	2·1	0·03	0·02	0·12
Cholecystitis and cholangitis	...	...	...	0·4	0·01	...	...	1·1	...	...	...	1·7	...	...	0·2	...	0·01	0·02
Colic	2·1	...	...	4·6	0·11	...	...	1·1	...	0·8	...	2·1	...	...	1·5	...	...	0·03
Colitis	2·1	...	...	0·6	0·02	...	...	1·1	...	1·3	...	5·1	...	...	0·1	...	...	0·01
Constipation	0·5	...	...	8·2	0·15	...	...	3·6	...	6·1	...	1·3	...	...	4·0	...	...	0·06
Diarrhœa	19·8	...	...	18·2	0·37	...	...	8·6	...	32·7	0·57	20·9	...	...	6·3	...	...	0·13
Enteritis	1·6	...	...	1·2	0·03	...	...	1·4	...	6·4	1·51	2·6	...	...	0·1	...	...	0·00
Fistula in ano.	1·6	...	...	0·4	0·03	...	...	...	...	...	...	0·9	...	...	0·5	...	0·01	0·05
Gastritis	7·5	...	...	6·8	0·21	...	...	2·8	...	2·5	...	9·4	...	...	1·2	...	0·01	0·04
Glossitis	...	...	...	0·1	0·01	...	...	...	...	...	...	0·4	...	...	0·1	...	...	0·00
Hœmorrhoids (piles)	4·8	...	...	5·9	0·22	...	...	1·7	...	...	...	3·4	...	...	1·8	0·01	0·01	0·08
Hepatitis acute	5·9	...	...	1·1	0·08	...	...	0·6	...	0·2	...	3·0	...	...	0·5	0·01	...	0·04
Hepatic abscess (Tropical abscess)	...	...	...	0·1	0·03	...	...	...	...	...	...	...	...	...	0·0	0·01	...	0·00
Hepatitis chronic (cirrhosis)	...	...	...	0·1	0·01	0·03	...	...	...	...	...	...	...	...	0·0	0·01	...	0·00
Hernia	0·5	...	...	2·5	0·25	0·03	0·06	0·8	...	1·7	...	4·7	...	...	1·1	0·01	0·15	0·08
Hypertrophy of the tonsils	1·6	...	...	2·3	0·07	...	...	5·0	...	41·1	...	0·4	...	...	0·2	...	...	0·01
Indigestion	1·1	...	...	3·4	0·11	...	...	1·1	...	1·7	...	4·8	...	...	4·5	...	0·01	0·12
Intestinal obstruction	...	...	...	0·1	0·03	...	...	0·3	...	...	...	...	...	...	0·0	0·02	...	0·00
Inflammation of the palate and pillars of the fauces	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jaundice	2·1	...	...	0·8	0·05	...	...	...	...	0·6	...	6·8	...	...	0·6	...	...	0·03
Pharyngitis	10·1	...	...	14·8	0·27	...	...	2·2	...	3·8	...	17·5	...	...	24·1	0·01	...	0·44

Peritonitis	...	...	...	0·2	0·02	0·06	...	...	...	0·2	...	...	...	...	0·1	0·02	0·01	0·01
Quinsy	1·1	...	...	1·8	0·06	...	...	1·7	...	0·4	...	2·1	...	...	0·4	...	...	0·01
Sprue	0·5	...	1·07	0·2	0·05	...	0·36	0·6	...	...	...	0·4	...	0·43	0·0	...	...	0·00
Stomatitis	...	...	...	0·5	0·02	...	...	...	...	1·1	...	...	...	...	0·4	...	...	0·01
Tonsillitis	20·8	...	...	34·4	0·82	...	...	9·1	...	27·4	...	20·5	...	...	5·5	0·01	...	0·13
Other diseases	7·5	...	1·07	7·0	0·41	0·14	0·17	4·7	...	7·0	0·57	9·0	...	0·43	1·2	0·01	0·06	0·07
Diseases due to disorders of nutrition or of metabolism.																		
Beri-beri	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diabetes mellitus	...	...	...	0·1	0·02	...	0·08	0·3	...	...	...	0·9	...	0·43	0·1	...	0·09	0·02
Gout	1·1	...	...	0·1	0·00	...	...	...	...	...	...	0·4	...	...	0·0	...	...	0·00
Inanition	...	...	...	0·1	0·01	...	...	0·3	...	3·0	1·32	...	...	...	0·0	...	...	0·00
Rickets	...	...	...	...	...	...	...	...	...	0·2	...	...	...	...	...	...	...	...
Scurvey	...	...	...	...	...	...	...	...	...	0·2	...	...	...	...	0·0	...	...	0·00
Other diseases	0·5	...	...	0·0	0·00	...	...	...	...	1·3	...	...	...	...	0·0	...	...	0·00
Diseases of the male organs of generation.																		
Balanitis	0·5	...	...	2·9	0·08	...	...	...	...	0·8	...	...	...	...	0·2	...	...	0·01
Epididymitis	...	...	...	1·1	0·04	...	...	...	...	...	...	...	...	...	0·2	...	...	0·01
Hydrocele	...	...	...	1·0	0·06	...	...	...	...	...	...	0·4	...	...	0·2	...	...	0·01
Hypertrophy of the prostate	0·5	...	1·07	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Orchitis	1·1	...	...	1·3	0·04	...	...	...	...	...	...	...	...	...	0·6	...	...	0·02
Paraphimosis	...	...	...	0·3	0·02	...	...	...	...	0·4	...	...	...	...	0·1	...	...	0·00
Phimosis	...	...	...	3·2	0·16	...	...	...	...	2·8	...	...	...	...	0·2	...	...	0·01
Prostatitis	...	...	...	0·5	0·03	...	...	...	...	...	...	...	...	...	0·0	...	...	0·00
Stricture of the urethra	...	...	...	0·1	0·00	...	...	...	...	...	...	...	...	...	0·1	...	0·02	0·01
Urethral fistula	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Urethritis	...	...	...	5·9	0·26	...	0·03	...	...	...	...	0·9	...	...	0·8	...	...	0·03
Varicocele	...	...	...	0·6	0·03	...	...	...	...	...	...	...	...	...	0·2	...	0·03	0·01
Other diseases	...	...	...	0·5	0·02	...	0·03	...	...	...	...	...	...	...	0·1	...	...	0·01
Diseases of the female organs of generation.																		
Abortion	...	...	...	...	...	...	...	27·4	...	...	...	...	...	...	...	...	...	...
Affection connected with pregnancy and parturition and consequent on parturition	...	...	...	...	...	...	...	22·5	0·28	...	...	...	...	...	...	...	...	...
Diseases of the ovary	...	...	...	...	...	...	...	1·7	...	...	...	...	...	...	...	...	...	...
Diseases of the fallopian tube	...	...	...	...	...	...	...	3·6	...	...	...	...	...	...	...	...	...	...
Displacements and distortions of the uterus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dysmenorrhœa	...	...	...	...	...	...	...	2·2	...	...	...	...	...	...	...	...	...	...
Endometritis	...	...	...	...	...	...	...	2·2	...	...	...	...	...	...	...	...	...	...

APPENDIX XXII—*contd.*

Diseases.	British Troops.										Indian Troops.						
	British Officers (B.S.)			B. O. Rs.			B. O. Rs. Wives.		B. O. Rs. Children.		British officers (I.S.).			V.C.Os. and I.O.Rs.			
	A.	D.	Invalids.	A.	Average constantly sick.	D.	Invalids.	A.	D.	A.	D.	A.	D.	Invalids.	A.	D.	Invalids.	Average constantly sick.
Diseases of the female organs of generation—contd.																		
Haemorrhage connected with parturition	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Inflammation of vagina	...	...	...	...	...	...	...	1·7	...	0·6	...	...	...	...	...	...	...	...
Menorrhaegia	...	...	...	...	...	...	...	2·5	...	...	...	...	...	...	...	...	...	...
Metrorrhaegia	...	...	...	...	...	...	...	1·7	...	...	...	...	...	...	...	...	...	...
Pelvic peritonitis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other diseases peculiar to women	...	...	...	...	...	...	...	23·0	...	...	...	...	...	...	...	...	...	...
Diseases affecting child.																		
Asphxia of child	...	...	...	...	...	...	...	...	...	0·2	0·19	...	...	...	...	...	...	...
Injury to child	...	...	...	...	...	...	...	...	...	0·2	...	...	...	...	...	...	...	...
Premature birth	...	...	...	...	...	...	...	...	...	0·8	0·76	...	...	...	...	...	...	...
Still-borne.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diseases of bones, joints, fasiæ and bursæ.																		
Arthritis	1·1	...	...	1·1	0·12	...	0·17	0·6	...	0·2	...	0·9	...	...	0·4	...	0·06	0·03
Diseases of the spine	...	...	...	0·1	0·01	...	0·03	...	...	...	...	...	...	...	0·1	...	0·04	0·01
Flat foot	...	...	...	0·2	0·01	...	0·08	...	...	...	...	...	...	...	...	...	...	...
Hammer-toe	...	...	...	0·6	0·05	...	...	...	...	...	...	...	...	...	...	...	...	...
Lumbago	1·6	...	...	0·9	0·02	...	...	...	...	...	...	2·1	...	...	1·4	...	0·01	0·04
Myalgia	0·5	...	...	4·5	0·10	...	...	...	...	...	...	2·6	...	...	2·9	...	...	0·07
Osteo-myelitis	...	...	...	0·4	0·03	...	...	...	...	0·8	...	...	...	...	0·2	...	0·02	0·04
Periostitis	...	...	...	0·3	0·02	...	0·03	...	...	...	...	0·9	...	...	0·4	...	...	0·02
Rupture of intra articular cartilage.	...	...	...	2·1	0·19	...	0·03	...	...	...	...	...	...	...	0·1	...	0·03	0·01
Synovitis	2·7	...	...	9·4	0·32	...	0·06	...	...	0·6	...	3·4	...	...	3·1	0·01	0·08	0·15
Subluxation of intra articular cartilage.	..	..	..	5·2	0·33	..	0·03	...	...	...	...	1·3	...	...	0·3	...	0·02	0·03
Other deformities of limbs	...	...	...	0·8	0·08	...	0·11	..	...	0·9	...	...	...	...	0·0	...	0·02	0·00
Other diseases	4.3	...	...	3·8	0·18	...	0·36	..	...	0·2	...	3·8	...	0·43	2·4	...	0.26	0·13

Diseases of the areolar tissue.																			
Boil	0·5	...	...	8·2	0·23	...	...	0·8	...	0·8	...	1·7	...	...	7·5	...	...	0·20
Carbuncle	0·5	...	...	0·6	0·02	...	...	...	...	...	...	0·9	...	...	0·2	...	...	0·01
Cellulitis	24·0	...	...	49·3	1·87	...	0·03	7·5	...	9·7	...	19·2	...	...	22·8	0·01	...	0·71
Cellulitis suppurative (abscess).	2·1	...	...	1·7	0·06	...	...	0·8	...	0·8	...	1·3	...	...	3·3	...	...	0·11
Other diseases	...	...	...	0·5	0·02	...	0·03	0·3	...	0·2	...	1·7	...	...	0·3	...	...	0·01
Diseases of the skin.																			
Acne	...	...	...	0·5	0·02	...	...	...	...	...	...	...	...	...	0·1	...	...	0·00
Dermatitis	3·2	...	...	5·4	0·27	...	0·03	...	...	0·6	...	0·9	...	...	5·1	...	0·01	0·22
Eczema	0·5	...	...	2·0	0·15	...	...	...	...	0·2	...	0·4	...	...	2·4	...	0·01	0·11
Favus	...	...	...	0·0	0·00	...	...	...	...	...	...	...	...	...	...	...	...	...
Herpes zoster	...	...	...	0·8	0·03	...	...	...	...	...	...	0·9	...	...	0·6	...	...	0·02
Impetigo	...	...	...	11·4	0·49	...	...	0·6	...	2·6	...	0·9	...	...	1·2	0·01	...	0·06
Ingrowing toe-nail	0·5	...	...	3·4	0·13	...	...	0·3	...	0·4	...	...	...	...	0·0	...	...	0·00
Onychia	0·5	...	...	0·3	0·01	...	...	0·3	...	...	...	0·9	...	...	0·1	...	...	0·00
Prickly heat	...	...	...	0·9	0·02	...	...	...	...	0·2	...	...	...	...	0·1	...	...	0·01
Psoriasis	...	...	...	0·8	0·05	...	...	...	...	0·4	...	...	...	...	0·3	...	0·03	0·03
Sycosis (folliculitis)	...	...	...	1·1	0·09	...	0·03	...	...	...	...	...	...	...	0·2	...	...	0·01
Tinea	1·6	...	...	9·5	0·30	...	0·03	...	...	0·2	...	4·7	...	0·43	3·8	...	...	0·13
Urticaria	1·6	...	...	0·9	0·02	...	...	0·3	...	0·4	...	0·4	...	...	0·9	...	...	0·02
Wart	...	...	...	1·1	0·06	...	...	...	...	...	...	...	...	...	0·1	...	...	0·00
Whitlow	...	...	...	0·6	0·02	...	...	0·6	...	...	...	...	...	...	1·6	...	...	0·04
Other diseases	...	...	...	3·2	0·17	...	0·03	1·1	...	0·6	...	1·3	...	...	0·7	...	0·02	0·03
Diseases of the urinary organs.																			
Calculus—																			
(*a*) Bladder	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·1	...	...	0·01
(*b*) Kidney	...	...	...	0·0	0·00	...	...	0·8	...	...	...	...	...	...	0·2	0·01	0·02	0·01
(*c*) Ureter	1·6	...	0·53	0·6	0·05	...	0·08	...	...	...	...	0·4	...	...	0·1	...	...	0·01
Cystitis	...	...	...	1·3	0·07	...	...	1·7	...	0·6	...	2·1	...	...	0·2	...	...	0·01
Haematuria	0·5	...	...	1·0	0·04	...	...	0·3	...	...	...	0·4	...	...	0·1	...	...	0·01
Incontinence of urine	...	...	...	0·3	0·01	...	0·03	0·3	...	0·4	...	...	...	...	0·0	...	...	0·00
Nephritis acute	...	...	...	0·2	0·04	...	0·03	...	...	0·6	0·19	0·9	...	...	0·1	0·02	0·03	0·01
Nephritis chronic	...	...	...	0·0	0·00	0·03	0·03	...	...	...	...	0·4	0·43	...	...	...	...	...
Renal colic	1·6	...	...	0·9	0·04	...	...	0·8	...	...	...	2·6	...	...	1·3	...	...	0·04
Other diseases	3·2	...	...	2·7	0·16	0·03	0·08	3·9	...	4·0	...	3·4	...	...	1·0	...	...	0·06
General injuries.																			
Burns and scalds	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·00
Effects of anti-rabic treatment.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·1	...	...	0·00
Effects of inoculation	2·7	...	...	0·4	0·01	...	...	...	...	...	...	...	...	...				

APPENDIX XXII—*concld.*

Diseases.	British Troops.											Indian Troops.					
	British Officers (B.S).			B. O. Rs.			B. O. Rs. Wives.		B. O. Rs. Children.		British Officers (I.S.).			V.C.Os. and I.O.Rs.			
	A.	D.	Invalids.	A.	Constantly sick.	D.	Invalids.	A.	D.	A.	D.	A.	D.	Invalids.	A.	D.	Invalids.	Average constantly sick.
Heat-exhaustion	1·1	...	...	1·9	0·06	0·06	...	...	...	0·4	...	1·3	...	...	0·2	...	...	0·01
Heat-stroke	...	...	...	0·4	0·02	0·06	...	...	...	0·2	...	...	...	...	...	...	...	...
Sun-stroke	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other injuries	1·6	...	...	0·8	0·02	0·28	...	...	...	0·4	0·19	1·3	0·43	...	0·1	0·16	...	0·00
Local injuries																		
Abrasions	2·1	...	...	3·2	0·08	...	...	...	...	0·4	...	1·7	...	...	2·4	...	...	0·07
Burns and scalds	0·5	...	...	2·0	0·09	...	0·03	...	...	2·5	...	1·3	...	...	1·8	0·01	...	0·07
Concussions	5·9	...	0·53	3·4	0·19	...	0·08	0·3	...	0·4	...	7·2	...	...	0·4	0·01	0·01	0·02
Contusions	8·0	...	...	12·7	0·33	...	0·06	0·8	...	0·9	...	9·8	...	0·43	17·6	0·02	0·08	0·55
Dislocations and displacements.	...	...	...	0·2	0·01	0·03	0·06	...	...	...	...	1·3	...	...	0·6	...	0·09	0·04
Fractures	11·2	0·53	2·14	14·6	0·92	0·11	0·42	1·4	...	5·9	...	17·1	...	0·85	11·6	0·11	0·49	0·84
Sprains and strains	4·8	...	...	17·0	0·47	...	0·06	0·3	...	0·2	...	7·2	...	...	7·6	...	0·02	0·20
Wounds gun-shot	1·6	...	...	1·6	0·12	0·42	0·11	...	...	0·2	...	1·3	0·85	...	1·6	0·44	0·32	0·20
Wounds others	2·7	...	...	5·6	0·20	0·08	...	0·6	...	3·6	...	9·4	0·43	...	12·6	0·03	0·05	0·44
Injuries self-inflicted	...	...	...	0·0	0·00	0·08	...	...	...	...	...	...	...	...	...	...	...	...
Other injuries	2·1	...	...	2·7	0·13	0·06	0·08	...	...	0·2	...	0·9	...	...	0·7	0·02	0·03	0·04
Tumours and cysts.																		
Carcinoma	...	...	...	0·1	0·01	0·03	0·03	0·3	...	...	...	0·4	0·43	...	0·0	...	0·03	0·00
Cysts	0·5	...	...	1·8	0·06	...	...	1·9	...	...	...	0·4	...	...	0·7	...	0·01	0·02
Sarcoma	...	...	...	0·0	0·00	...	0·03	..	...	...	...	...	...	...	0·0	...	0·02	0·00
New growths malignant (other cases).	2·1	...	0·53	0·5	0·04	...	0·08	0·8	...	0·6	0·38	...	...	...	0·1	...	...	0·01
New growths non-malignant	0·5	...	0·53	0·8	0·06	...	0·11	...	...	...	...	...	...	0·43	0·5	...	0·06	0·03
Malformations	...	...	...	0·3	0·01	...	0·03	0·3	...	0·6	0·19	...	...	...	0·1	...	0·01	0·01

Alcohol	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·01	...	...
Arsenic	...	...	...	0·0	0·00	...	...	...	...	...	...	...	...	...	...	0·0	0·01	...	...	...	0·00
Chloroform	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other chemical poisons	...	...	...	0·1	0·01	0·00	...	...	...	0·2	0·19	...	...	...	...	0·0	...	...	...	...	0·00
Opium	...	...	...	...	0·00	...	0·03	...	...	...	...	...	...	...	...	0·1	0·03	...	...	...	0·00
Venom of insects	...	...	...	0·1	0·00	...	...	0·3	...	...	...	...	...	...	...	...	...	...	...	...	...
Venom of Ophidia (snake bite).	...	...	...	0·1	0·00	...	...	...	...	...	...	...	...	...	...	0·1	0·01	...	...	...	0·00
Other poisons	...	...	...	...	...	...	...	0·3	...	3·0	...	...	...	...	...	0·1	0·01	...	...	...	0·01
No appreciable disease	1·1	...	...	4·3	0·15	...	...	1·7	...	...	...	1·7	...	...	0·8	...	...	...	...	...	0·03
All other causes	1·1	...	...	0·4	0·04	...	...	...	...	...	...	0·9	...	...	0·1	...	...	...	...	...	0·09

A.—Admissions. D.—Deaths. I.—Invalid. A.C.S.—Average constantly sick.

GIPD—M—673 Army III—8.2.41—600.

MDMS—A 4(N)
600

ANNUAL REPORT

ON THE

HEALTH OF THE ARMY IN INDIA

FOR THE YEAR

1940

VOLUME III

Part I

ROYAL ASIATIC SOCIETY LIBRARY OF THE BOMBAY BRANCH

Z-20430/D. M. S. 5 (b)

GENERAL HEADQUARTERS, INDIA
Medical Directorate
New Delhi.

PUBLISHED BY THE MANAGER OF PUBLICATIONS, DELHI.
PRINTED BY THE MANAGER, GOVERNMENT OF INDIA PRESS, SIMLA.
1941.

Price: Rs. 2-6-0 or 4s.

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GENERAL HEADQUARTERS,
INDIA.

MEDICAL DIRECTORATE.

Simla, the 3rd September 1941.

SIR,

I have the honour to submit the accompanying report on the Health of the Army in India for the year 1940.

At the end of the year, it was considered whether or not this report should be held in abeyance during the war years. It was decided, however, that, in spite of the time and labour involved, a full report should be produced. In making this decision it was hoped that the data included in the report would prove of value in future years as showing the effect which a war waged outside India had on the health of the Army in India.

The health of the Army for 1940, while not so good as in former years, is considered to have been on the whole reasonably satisfactory, taking into account the many adverse factors present throughout the year. These are fully discussed in the body of the report.

For British other ranks, admissions to hospital per 1,000 of strength were 723·3; and for Indian other ranks, 549·0, rates considerably above those of the years immediately preceding 1940.

The reports on the special subjects indicate the great amount of preventive and curative work carried out by the military medical services in India during the year.

I have the honour to be,

Sir,

Your obedient servant,

A. CAMPBELL MUNRO,

Major-General,

Director of Medical Services in India.

The Secretary,

Defence Department,

Government of India.

M&32Army

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ABBREVIATIONS.

A.	Admissions.
A. D. H.	Assistant Director of Hygiene.
A. D. M. S.	Assistant Director of Medical Services.
A. D. P.	Assistant Director of Pathology.
Av. c. s.	Average constantly sick.
G. H. Q.	General Headquarters.
B. M. H.	British military hospital.
B. Os.	British officers.
B. O. Rs.	British other Ranks.
C.	Cases.
C. M. %	Case mortality per cent.
D.	Deaths.
D. A. D. P.	Deputy Assistant Director of Pathology.
D. A. H.	Disordered action of the heart.
D. D. M. S.	Deputy Director of Medical Services
D. M. S.	Director of Medical Services.
E. C.	Eastern Command.
E. N. T.	Ear, nose, throat.
G. S. W.	Gun shot wound.
I.	Invalids.
I. M. H.	Indian military hospital.
I. O. Rs.	Indian other ranks.
I. C. Os.	Indian commissioned officers.
M. Os.	Medical officers.
N. C. Os.	Non-commissioned officers.
N. W. F. P.	North-West Frontier Province.
N. C.	Northern Command.
O. C.	Officer commanding.
P.	Primary.
P. A.	Per annum.
P. M.	Per mille.
P. U. O.	Pyroxia of uncertain origin.
P. & A.	Presidency and Assam District.
R.	Revaccinations.
R. N.	Royal Navy.
R. A. F.	Royal Air Force.
S. E. M. O.	Senior Executive Medical Officer.
S. C.	Southern Command.
T. A.	Territorial Army.
T. A. B.	Typhoid, paratyphoid A and B.
U. K.	United Kingdom.
U. P.	United Provinces.
V. C. Os.	Viceroy's commissioned officers.
V. D.	Venereal diseases.
V. D. H.	Valvular disease of the heart.
W. & C.	Women and children.
W. O.	Warrant officer.
W. I. D.	Western Independent District.

Annual Report on the Health of the Army in India for the year 1940.

VOLUME III.

PART I.

SECTION I.

ON THE HEALTH OF THE BRITISH ARMY IN INDIA.

TABLE 1.

General health statistics of the British Army in India during 1940.

	Ratios per 1,000 strength.			
	Admissions.	Deaths.	Invalids sent home.	Average constantly sick.
Officers	533·5	4·95	9·91	19·99
Other ranks	723·3	2·77	6·81	30·97
Members of nursing service	547·7	0·50	1·00	22·26
Other ranks' wives	349·6	2·67	3·00	11·69
Other ranks' children	375·1	14·82	..	11·07

1. General survey.

The general health of the personnel of the British Army in India during 1940 has not been so good as in the immediately preceding years.

For officers, compared to 1939, there has been an increase of 98·4 in the admission to hospital ratio per 1,000 and of 2·81 in the death ratio.

For other ranks the admission to hospital ratio per 1,000 of strength shows, at 723·3, an increase of 57·2 compared to 1939. The average constantly sick ratio per 1000, which is a important index of a population's healthiness, gives, at 30·97, the highest figure recorded for many years. The number of deaths per 1000 of strength, at 2·77, remains almost the same as in 1939. The numbers invalided per 1,000 has fallen from 9·14 in 1939 to 6·81 in 1940.

For wives of other ranks the admission ratio has increased from 263·9 in 1939, to 349·6 in 1940 ; while for children this ratio has risen from 374·1 to 375·1.

TABLE 2.

Comparative table.—General sickness of officers and other ranks.

Periods.	Ratio per 1,000.					
	Admissions.		Deaths.		Invalids.	
	Officers.	Other ranks.	Officers.	Other ranks.	Officers.	Other ranks.
1910-1914 . . .	567·5	567·2	5·14	4·36	16·30	7·03
1920-1924 . . .	673·7	791·9	6·71	5·24	20·99	18·91
1925-1929 . . .	539·9	619·4	5·25	2·99	17·44	13·50
1930-1934 . . .	428·6	604·7	6·69	2·64	20·09	8·88
1935-1939 . . .	436·9	597·4	4·82	2·54	21·24	9·47
1940 . . .	535·5	723·3	4·95	2·77	9·91	6·81

The following table shows the admissions, deaths and invaliding per 1,000 of strength for officers and other ranks for the past six years :—

TABLE 3.

Comparative table.—General sickness of officers and other ranks.

Years.	Ratio per 1,000.					
	Admissions.		Deaths.		Invalids.	
	Officers.	Other ranks.	Officers.	Other ranks.	Officers.	Other ranks.
1935 . . .	470·1	567·1	6·74	2·55	24·25	6·90
1936 . . .	428·8	582·1	6·17	2·48	22·92	10·99
1937 . . .	421·4	567·8	3·41	2·15	18·00	10·97
1938 . . .	428·9	603·7	5·63	2·78	15·95	9·35
1939 . . .	435·1	636·1	2·14	2·75	25·09	9·14
1940 . . .	533·5	723·3	4·95	2·77	9·91	6·81

2. Summary of interesting features of the year.

The most interesting features of 1940 have been :—

(*a*) The effect which a war waged outside India has had on sick rates in India.

(*b*) The marked regression in the downward trend, which had been apparent for the last ten years, in the incidence of malaria.

(*c*) The continued upward trend of the incidence of venereal diseases.

(*d*) The continued low incidence of sandfly fever in Northern Command for the fourth consecutive year.

(*e*) The remarkably low admission rate for the troops in Waziristan, considering that war conditions were in force in that District throughout the year.

(*f*) The fact that it was found necessary to increase the number of hygiene officers to deal with the demands of expansion, new construction (hutting), inspection of food factories, and increased training.

8. Factors which may have affected the incidence of disease amongst troops.

(*a*) Owing to the demand for field medical units for overseas service, the establishment of regular medical officers and assistant surgeons has fallen to a level only just sufficient to maintain the administration of hospitals in India. Numerous and frequent changes in the medical charge of units and the inexperrience of young medical officers have had an effect in lowering the standard of medical and sanitary supervision and in interrupting the continuity of anti-malarial works. The tendency for young medical officers to hospitalise cases too long and to treat in hospital cases which could be treated as outpatients was also noticed in some Districts.

(*b*) The presence of a larger number of troops in the plains throughout the hot weather and autumn, intensive training and the necessity for moves throughout this period had an effect on the incidence of sandfly fever, malaria and dysentery.

(*c*) In the Punjab a malarial epidemic year had been forecast. This actually materialised in many areas. For example, in the S. W. Punjab *near* Multan malaria had its greatest incidence in the memory of most people. The British unit there had 216 cases; 40 in October, 100 in November and 41 in December.

(*d*) In Waziristan disturbed conditions continued throughout the year but the health of troops remained excellent; and there was actually a decrease of 27 per 1,000 in the admission rate. Operations took place in the Ahmedzai salient with consequent outbreaks of dysentery and sandfly fever; in the Daur country in August with an outbreak of malaria; and at Tauda China in the snow in December with an increase in respiratory diseases.

(*e*) In Western (I) District there was an increase in rainfall at Fort Sandeman and in Sind; and, following this, a 40 per cent. increase in the general incidence of malaria.

(*f*) There was a marked increase in the movement of units, often through unhealthy districts.

(*g*) The arrival of young drafts and of men unaccustomed to India was a factor which has materially affected the general health of British troops, especially as groups of these men arrived during the hot weather and many were kept in the plains.

(*h*) In Northern Command the health of Civil communities was normal and without epidemics, except of malaria. Enteric group fevers and dysentery were universally present; small-pox was rife; cholera was ever threatening as shown by localised out-breaks, in one of which Napalese troops at Hassan Abdal were involved in November; malaria, though not pandemic, developed to epidemic proportion in the Multan area and the Daur country on the Frontier.

4. Officers.

For officers, compared to 1939, there has been an increase of 98·4 in the admission to hospital ratio per 1,000 and of 2·81 in the death ratio. The number of cases invalided per 1,000 of strength has fallen from 25·09 to 9·91;

this however is chiefly due (*a*) to the desire to retain all officers in the Army who can usefully perform any work and (*b*) to the difficulties of transporting invalids to the United Kingdom.

The principal causes of admission to hospital were as follows :—

TABLE 4.

	Per 1,000.
Dysentery	47·69
Malaria	44·62
Diarrhœa	43·13
Cellulitis	26·76
Tonsillitis	26·76
Jaundice	23·30
Sandfly fever	21·80

TABLE 5.

Comparative table for sickness of officers over the past 10 years.

	Ratios per 1,000.		
	Admissions.	Deaths.	Invaliding.
1931	420·4	7·76	17·68
1932	463·2	6·54	27·45
1933	437·8	6·37	17·83
1934	429·2	6·83	15·78
1935	470·1	6·74	24·25
1936	428·8	6·17	22·92
1937	421·4	3·41	18·00
1938	428·9	5·63	15·95
1939	435·1	2·14	25·09
1940	533·5	4·95	9·91

5. Other ranks.

Compared to 1939, the admission to hospital ratio per 1,000 has increased from 666·1 to 723·3. This is a serious increase. The year 1940, as has been discussed in paragraphs 2 and 3, was, however, exceptional in that a large number of factors, each conducive to increase in the sick rate, were present concurrently.

Compared to 1939, total admission ratios showed a steady increase each month up to August, the largest increases being in Feburary with 9·8 per 1,000 and April with 13·6 per 1,000. This was due to the minor-septic group, dysentery-diarrhœa group, and venereal diseases. August and September showed decreases in ratios of 5 and 7 per 1,000. The final increase for the year was 58·4 per 1,000.

The graph of monthly admissions is on a higher plane than normal owing to the general increases indicated above and shows two very distinct peaks, one in July reaching to 74·7 per 1,000 for the month and the other in November at 70·4 per 1,000. The average constantly sick curve closely follows that for admissions with distinct peaks for July and November.

In Eastern Command there has been a decrease of nearly 4 per 1,000 compared to 1939 but admissions are still well above pre-war rates. There were appreciable increases in malaria, venereal, minor septic, tonsillitis and effects of heat offset by decreases in dengue, sandfly fever, injuries, dysentery and influenza.

The serious increase of 112 per 1,000 occurred in Northern Command to give an admission rate of 781·22, which is 163 per 1,000 more than the last pre-war rate. The death rate 3·80 was the highest for 15 years and the average constantly sick, the criterion of actual inefficiency, was, at 30·41 per 1,000, the worst known for many years. All districts in Northern Command share equally in this general increase, an increase which was apparent in practically every month of 1940 compared to 1939. In July and November the equivalent annual admission ratio exceeded 1,000 per 1,000. The chief causes were increases in malaria, dysentery, minor-septic and tonsillitis. In Western (Independent) District there has been an increase in admissions from 692·17 per 1,000 in 1939 to 719·09 in 1940.

The principal causes of admission to hospital, showing increase or decrease compared with 1939, are given in Table 6.

TABLE 6.

Comparative table of diseases.

	1939.	1940.	Increase or decrease.
Malaria	58·1	73·3	+15·2
Cellulitis	51·1	54·3	+ 3·2
Tonsillitis	34·4	43·1	+ 8·7
Dysentery	29·0	32·9	+ 3·9
Gonorrhœa	32·7	30·9	— 1·8
Sandfly fever	30·7	25·7	— 5·0
Diarrhœa	18·2	25·0	+ 6·8
Bronchitis	18·2	19·8	+ 1·6
Pharyngitis	14·8	15·3	+ 0·5
Fractures	14·6	13·5	— 1·1
Syphilis	8·4	12·7	+ 4·3
Sprain and strains	17·0	12·6	— 4·4
Diseases of the mucus membrane	8·3	12·3	+ 4·0
Influenza	9·3	12·0	+ 2·7
Impetigo contagiosa	11·3	11·7	+ 0·4
Contusions	12·7	11·0	— 1·7
Tinea	9·5	9·9	+ 0·4
Common cold	11·2	9·3	— 1·9
Jaundice	6·3	9·0	+ 2·7
Soft chancre	10·2	8·8	— 1·4
Appendicitis	8·0	8·6	+ 0·6
Gastritis	6·8	8·5	+ 1·7
Synovitis	9·4	7·7	— 1·7
Boils	8·2	7·3	— 0·9
Wounds	5·6	7·2	+ 1·6
Dengue	9·6	6·7	— 2·9
Other diseases of bones and muscles	3·8	6·7	+ 2·9
Dermatitis	5·4	6·7	+ 1·3
Constipation	8·2	6·3	— 1·9
Urethritis	5·9	6·2	+ 0·3
Lymphadenitis	5·9	6·0	+ 0·1
Pneumonia lobar & lobular	4·7	5·9	+ 1·2
Otitis externa	6·4	5·9	— 0·5
Otitis media	4·3	5·8	+ 1·5
Headache	5·3	5·5	+ 0·2

Average constantly sick.—The average number constantly sick in hospital per 1,000 of strength in 1940 was 30·97, compared to 27·96 in 1939.

The diseases chiefly responsible were :—

TABLE 7.

Average constantly sick per 1,000 of strength.

Malaria	2·83
Gonorrhœa	1·78
Cellulitis	1·72
Dysentery	1·38
Syphilis	0·94
Tonsillitis	1·13
Fractures	0·90
Soft chancre	0·65
Bronchitis	0·77
Sandfly fever	0·54
Appendicitis	0·53

The average number constantly under treatment in barracks per 1,000 of strength was 23·59, giving a decrease of 1·51 per 1,000 compared to 1939.

The combined ratio of constantly sick in hospital and under treatment in barracks was 54·66 per 1,000 compared to 53·06 in 1939 and 52·27 in 1938.

TABLE 8.

Monthly incidence of admissions all causes and of the principal diseases.

All ratios per 1,000.

Month.	All causes.	Malaria.	Dysentery-diarrhœa group.	Minor septic.	Local injuries.	Venereal.
January	51·7	1·4	1·2	3·5	5·3	7·1
February	48·0	1·1	4·0	4·7	4·2	4·9
March	53·2	1·4	6·1	4·8	4·4	4·6
April	58·7	1·9	9·2	5·5	4·1	3·7
May	62·1	2·6	5·5	5·1	5·3	3·6
June	64·4	4·2	4·6	6·4	5·4	4·7
July	74·7	7·0	5·0	8·3	5·6	5·0
August	67·0	8·6	7·2	6·5	4·2	4·9
September	62·2	10·3	3·7	6·9	4·6	4·1
October	67·1	14·7	3·3	5·8	5·0	5·4
November	71·0	12·8	3·8	6·0	6·5	5·6
December	46·9	6·5	3·1	4·3	4·3	8·4

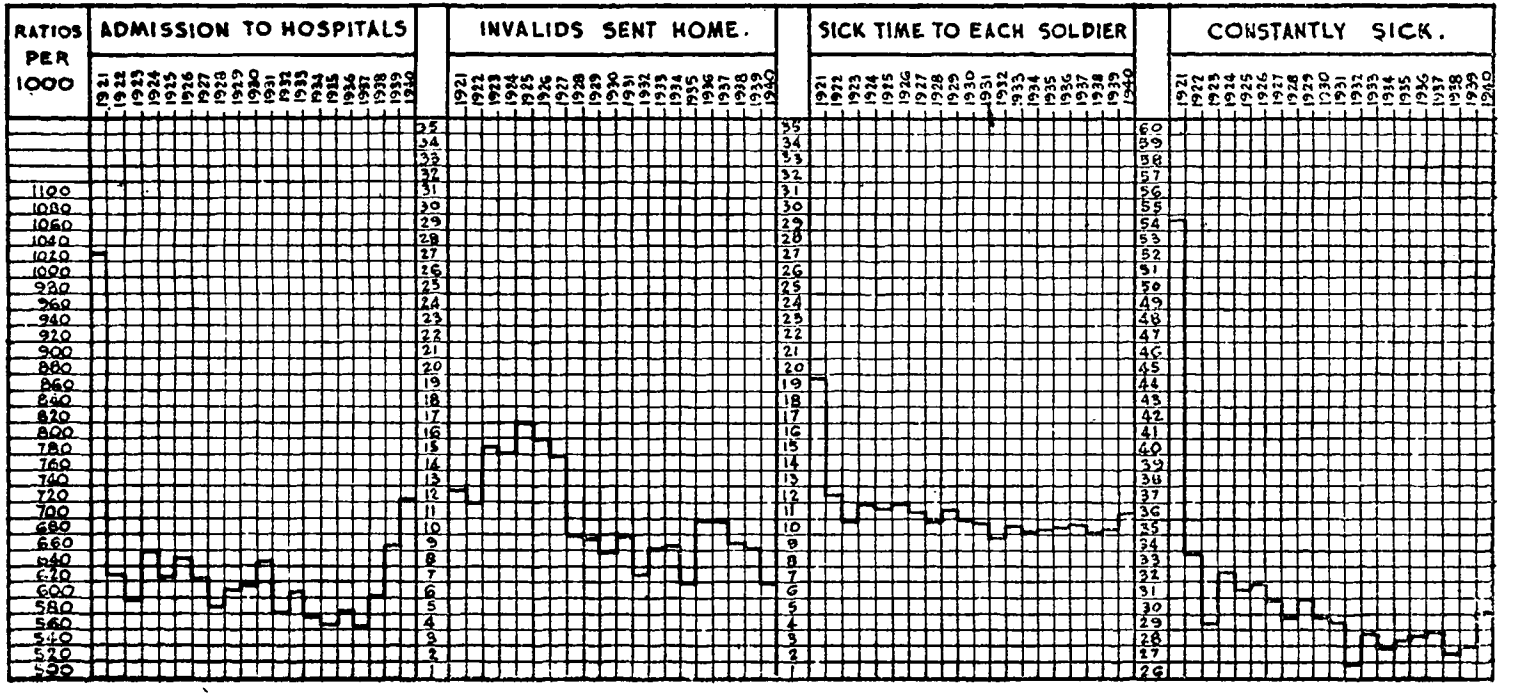
TABLE 9.

Table showing total admissions and deaths ratios per 1,000 of the strength for all causes and certain important diseases for the larger stations compared with all India.

	Stations with total admission ratios all causes, higher than all India.							Stations with total admission ratios all causes, lower than all India.							
	Nowshera.	Rawalpindi.	Bombay.	Jubbulpore.	Meerut.	Quetta.	All India.	Karachi.	Lahore.	Poona.	Secunderabad.	Razmak.	Lucknow.	Madras.	Alipore.
All causes :—															
Admissions	918·3	73·8	881·9	808·4	783·0	777·3	723·3	708·6	697·2	677·8	670·0	634·3	631·9	616·7	598·5
Deaths	3·20	1·17	4·81	2·05	2·85	1·07	2·77	3·09	3·31	2·46	3·50	14·23	2·74	1·05	3·00
A. C. Sick	26·85	36·79	30·39	33·68	29·48	38·09	30·97	26·25	34·09	38·92	28·11	29·19	33·44	26·14	28·60
Malaria :—															
Admissions	80·6	145·0	102·8	117·4	93·4	86·7	73·4	49·6	47·5	93·1	20·0	166·2	9·2	13·7	30·9
Deaths	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sandfly fever :—															
Admissions	35·0	63·0	0·8	14·4	8·5	40·7	25·7	15·5	14·4	..	13·6	37·3	27·51	..	..
Deaths	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Enteric group of fevors :—															
Admissions	..	0·6	..	..	0·71	..	1·2	..	..	..	0·7	..	..	1·0	..
Deaths	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dysentery :—															
Admissions	38·1	38·9	8·0	37·1	26·4	35·3	33·0	46·5	47·5	34·6	30·0	44·8	27·5	13·7	32·4
Deaths	..	..	..	..	..	1·07	0·06	..	..	..	..	0·67	..	..	..
Diarrhœa :—															
Admissions	90·1	21·8	24·0	16·5	44·2	23·6	25·0	28·9	24·3	11·1	20·0	26·5	19·2	16·9	7·5
Deaths	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Influenza :—															
Admissions	13·8	38·9	28·9	..	12·8	3·2	12·1	..	3·3	26·5	39·3	..	8·2	13·7	..
Deaths	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pneumonia : Lobar and Lobular :—															
Admissions	8·5	8·2	35·3	5·1	6·4	7·5	6·0	1·0	7·7	6·1	2·1	2·0	4·6	..	3·8
Deaths	..	..	..	1·02	..	..	0·06	..	..	..	..	..	..	..	0·75
Minor Septic Diseases :—															
Admissions	79·5	73·7	79·5	82·3	68·4	43·9	70·1	118·8	69·6	30·4	53·6	45·4	60·4	89·7	44·5
Deaths	..	..	..	..	..	..	0·03	..	..	..	..	..	..	..	..
Venereal Diseases :—															
Admissions	60·4	47·1	105·2	83·4	74·1	17·1	58·1	30·11	47·5	84·6	62·1	16·3	46·7	57·0	92·8
Deaths	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Local Injuries :—															
Admissions	74·2	61·35	48·2	54·6	49·9	58·9	58·6	73·3	51·1	38·9	94·3	62·9	57·7	51·7	40·7
Deaths	1·03	..	2·4	..	2·13	..	0·55	..	1·10	..	2·85	12·2	9·1	..	..
Heat Stroke :—															
Admissions	1·1	..	..	1·0	0·7	..	1·2	..	2·2	..	..	..	..	1·0	..
Deaths	..	..	..	1·02	..	..	0·03	..	1·10	..	..	..	..	..	..
Heat Exhaustion :—															
Admissions	9·5	11·8	0·8	..	15·7	..	4·9	1·0	8·8	..	..	..	..	..	..
Deaths	1·06	..	..	..	..	..	0·15	..	..	..	..	..	..	..	..

CHART Nº 1

RATIOS PER 1000 ADMITTED TO HOSPITAL, INVALIDS SENT HOME AND CONSTANTLY SICK, AND AV. SICK TIME TO EACH SOLDIER FROM 1921 TO 1940.



M622Army

TOTAL ADMISSIONS ALL CAUSES, ALL INDIA. BRITISH TROOPS.

MONTHLY ADMISSION RATIOS PER 1,000 OF STRENGTH.

CHART No. II.

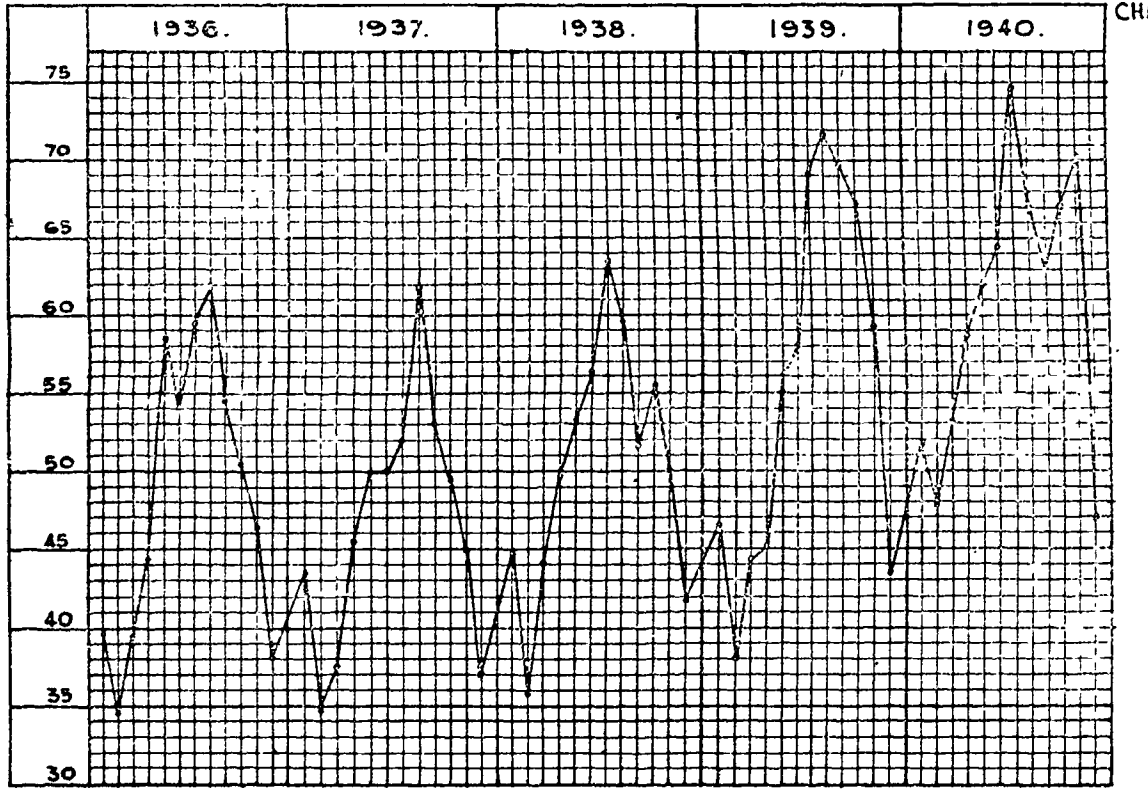
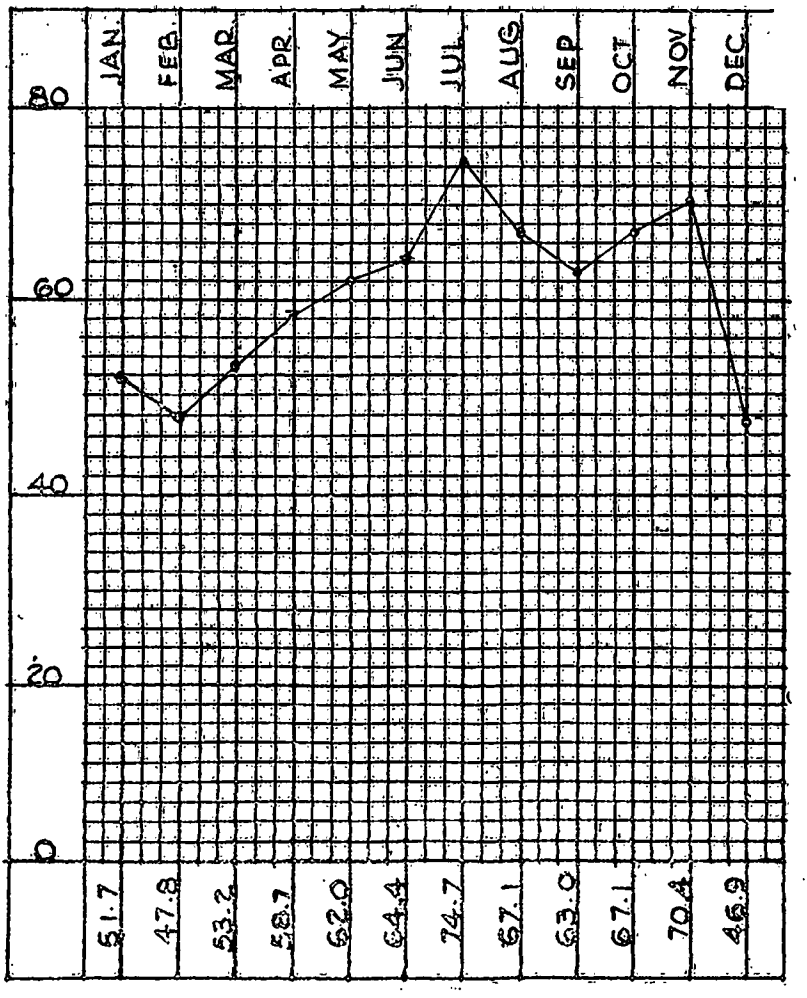


CHART No III

TOTAL ADMISSIONS ALL CAUSES
ALL INDIA. 1940
BRITISH TROOPS.
RATIO PER 1,000 OF STRENGTH.



Principal diseases affecting British other ranks.

6. Malaria.

Malaria admission rates were thoroughly satisfactory upto September, being actually less than those of 1939 for the first seven months of the year. However, increases in the last three months give a final nett increase of 18·8 per 1,000 for the whole year, compared with 1939.

The monthly graph for the year shows a large and abnormally high curve for the second half of the year culminating in a peak in November. This curve was composed of two distinct portions ; an early autumn rise from districts in the east and south where the malaria peak occurred in August and September, and a high rise late in November and December in Northern districts, Lahore, Rawalpindi and Peshawar showing unusually high November peaks.

In Northern Command malaria once more resumed its position at the head of the list of diseases, after having been reduced below first place for 3 consecutive years. The admission rate rose to 120 per 1,000, almost double that of 1939, more than double those of 1938 and 1937 and approaching that of the notorious 1933. The high peak of cases in November was an unusual feature partly due to a heavy outbreak in the British unit at Multan and partly to cases contracted during the Waziristan reliefs.

There is no doubt, however, that antimalarial measures in this Command were effective ; and that without them admission rates might well have soared to, or above, rates prevailing twenty and thirty years ago.

In Waziristan District the admission rates for malaria have been very considerably higher for the four years 1937 to 1940 than those for the years 1932 to 1936. This has been because a majority of troops from 1937 to 1940 spent the malarial seasons in operations in the lower malarious valleys. During 1940, out of 356 admissions for malaria 244 occurred at Razmak ; but a careful investigation showed that Razmak continues to be a non-malarious station and that these cases were infected while on column in the lower valleys. Razani camp has proved itself to be very malarious and the site has now been changed to a healthier locality.

In Eastern Command, at 42·65, the malarial admission ratio shows an increase of 12 per 1,000 over 1939 and is the highest for a number of years. This was mainly due to :—

(*a*) 60 admissions from a training camp at Ormanjhi, a highly malarious area near Ranchi, at which antimalarial precautions had not been properly carried out.

(*b*) A larger proportion of men remained in the plains in the Autumn.

(*c*) The influx of an increased reservoir of infection in stations by the arrival of infected Indian recruits.

In Western (I) District there was a small decrease to 66 per 1,000, which is ascribed in part to the restrictions imposed on the use of certain malarious areas as training camps.

TABLE 10.

Malarial incidence over the past 11 years.

Ratios per 1,000.

1913	125·5
1919	217·8
1930	118·4
1931	112·5
1932	82·1
1933	103·3
1934	67·5
1935	56·1
1936	58·0
1937	44·5
1938	50·4
1939	58·1
1940	73·4

TABLE 11.

Admissions by Commands—Fresh and Relapse.

		Admission—Ratios per 1,000.				
		1936	1937	1938	1939	1940
Northern Command	Fresh.	45·6	30·2	34·0	51·8	88·6
	Relapse.	32·8	15·3	22·0	24·0	30·7
	Total.	78·5	45·6	56·0	78·5	119·3
Eastern Command	Fresh.	30·5	14·9	19·4	25·8	33·9
	Relapse.	6·3	9·0	13·6	5·9	8·6
	Total.	36·8	23·9	33·0	31·8	42·5
Southern Command	Fresh.	36·8	34·2	43·7	51·0	43·5
	Relapse.	9·0	9·0	16·3	10·8	8·7
	Total	45·3	43·2	60·0	61·8	52·2
Western (I) Distt.	Fresh.	56·8	101·5	38·3	43·1	54·6
	Relapse.	47·1	22·0	21·0	25·2	13·1
	Total.	103·9	123·5	59·2	68·3	67·8
*All India	Fresh.	39·2	32·6	32·6	43·3	57·8
	Relapse.	18·7	12·0	17·8	14·8	16·5
	Total.	58·0	44·5	50·4	58·1	73·4

*1937, 1938, 1939 and 1940 do not include Burma.

CHART No. IV.

MALARIA. BRITISH TROOPS.

ADMISSION RATIOS PER 1000 OF STRENGTH.

1919	217·6
1920	176·6
1921	321·7
1922	175·4
1923	172·2
1924	206·8
1925	192·0
1926	165·3
1927	138·8
1928	91·3
1929	116·0
1930	118·4
1931	112·5
1932	84·1
1933	103·3
1934	67·5
1935	56·1
1936	58·0
1937	44·5
1938	50·4
1939	58·1
1940	73·4

MALARIA , ALL INDIA. BRITISH TROOPS. CHART Nº V

MONTHLY ADMISSION RATIOS PER 1,000 OF STRENGTH.

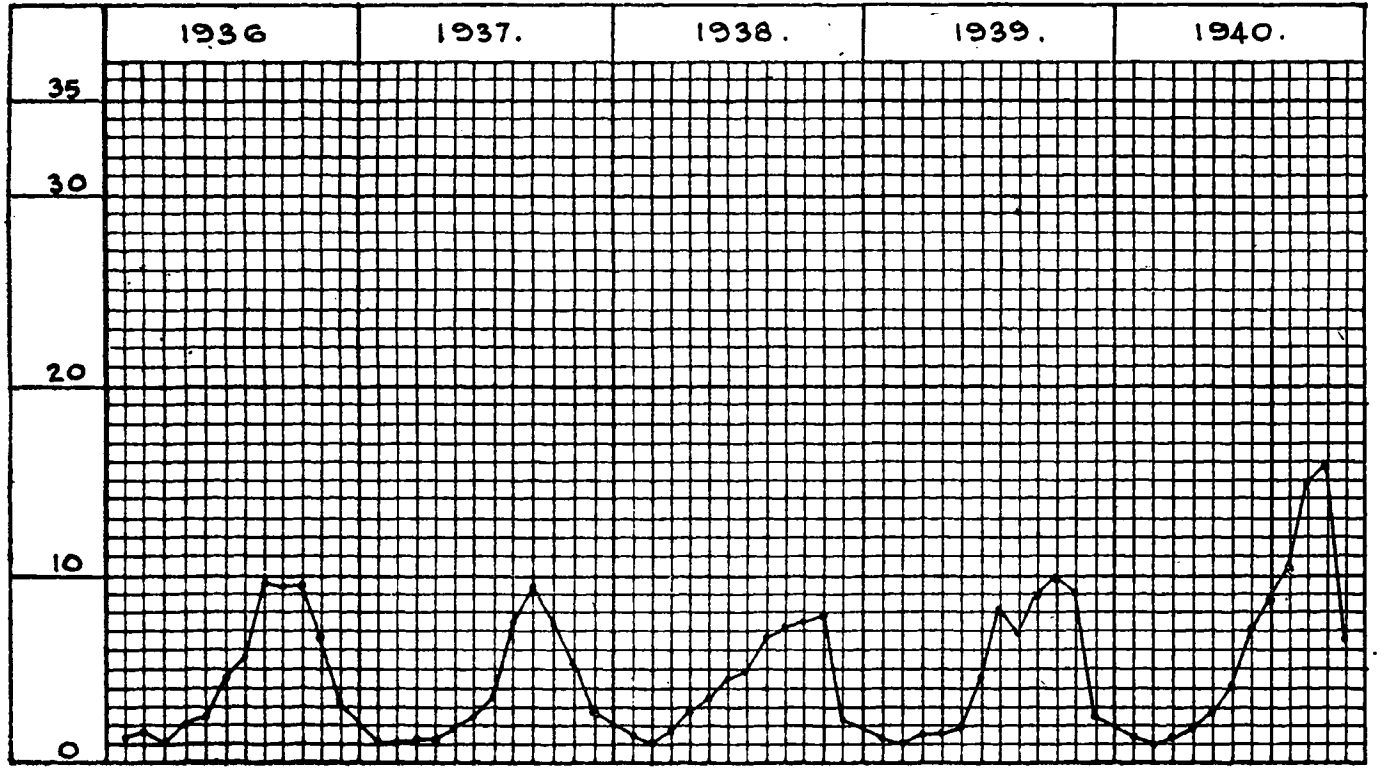


TABLE 12.

Malaria incidence in Western (I) District.

	Admission rate per 1000.
Quetta.	
1893	1171·12
1894	864·85
1918	490·00
Western (I) District.	
1933	204·00
1934	160·47
1935	136·10
1936	103·90
1937	123·55
1938	59·20
1939	68·30
1940	66·39

TABLE 13.

Comparative diagnoses of malaria by Commands.

Command.	Year.	B. T.	M. T.	Q. T.	(Percentages) Mixed.	Clinical.
Northern	1938	77·45	21·07	..	0·37	1·11
	1939	73·24	23·82	0·21	0·52	2·20
	1940	79·56	18·71	..	0·15	1·58
Eastern	1938	79·36	10·78	0·91	3·90	5·05
	1939	74·92	18·95	0·29	1·75	4·08
	1940	63·40	28·23	0·24	4·78	3·35
Southern	1938	64·99	23·43	3·91	5·30	2·37
	1939	65·33	27·86	1·70	2·48	2·63
	1940	69·06	26·02	0·41	1·43	3·07
Western (I) District	1938	77·03	14·35	..	0·96	7·65
	1939	68·46	20·13	1·34	4·70	5·37
	1940	67·43	28·68	0·78	0·78	2·33
All India	1938	73·67	19·13	1·47	2·77	2·77
	1939	70·73	24·01	0·76	1·63	2·87
	1940	73·87	22·45	0·17	1·27	2·24

7. Sandfly fever.

Compared to 1939, this disease has shown a decrease of 5 per 1,000 to give at 25·7 per 1,000, one of the lowest figures ever recorded.

TABLE 14.

Sandfly fever over the past 10 years.

Ratios per 1,000.

1931	39·4
1932	40·9
1933	40·9
1934	36·2
1935	36·5
1936	33·8
1937	24·6
1938	24·8
1939	30·7
1940	25·7

Northern Command, for the fourth consecutive year, shows a rate much below former years, being, at 51·27, 34·31 per 1,000 lower than the peak year of 1933. This is attributed to intensive spraying of barrack-rooms.

TABLE 15.

Sandfly fever in Northern Command.

Ratios per 1,000.

Year.	Admissions.
1932	84·38
1933	85·58
1934	80·04
1935	82·37
1936	80·37
1937	51·15*
1938	47·57
1939	52·39
1940	51·27

*Spraying campaign first instituted.

8. Oriental sore.

There has been an increase in the incidence of cutaneous Leishmaniasis during 1940. The table below shows the incidence of this disease over the past five years :—

TABLE 16.

Year.	Ratio per 1,000.
1936	0·65
1937	0·25
1938	0·19
1939	0·67
1940	0·74

TABLE 17.

Incidence of oriental sore in Quetta Cantonment.

Year.	Ratio per 1,000.
1936	43·75
1937	23·06
1938	43·16
1939	21·23
1940	8·21

As will be seen from the table above there has been a steady decline in the incidence of oriental sore in Quetta over the last five years. The attack on the sandfly has received much attention in Quetta of recent years, and the most effective measure has probably been spraying barrack rooms with insecticides.

9. Dengue.

In Eastern Command as a whole there has been a well marked decrease; but the biannual fluctuation was again shown.

	1936	1937	1938	1939	1940
Eastern Command	5·41	28·84	7·89	26·99	14·76

At Agra all cases were connected directly with troops stationed in the Fort close to mosquito breeding areas near the river Jumna.

In Calcutta area there were only 121 cases compared with 288 of the previous year. The type was similar to that of the 1939 epidemic.

Northern Command had only 8 cases, of which one at Nowshera was clearly a Dinapore infection.

TABLE 18.

The incidence of dengue fever.

Ratios per 1,000.

Year.	Admissions.
1933	11·7
1934	6·6
1935	5·0
1936	4·7
1937	12·2
1938	3·9
1939	9·6
1940	6·7

10. Fevers of the typhus group.

The amount of sickness due to this group remained small, the total cases occurring among British troops during 1940 being only 30.

TABLE 19.

The Incidence of typhus fever.

Year.	Actuals.
1933	23
1934	52
1935	19
1936	44
1937	29
1938	23
1939	30
1940	30

TABLE 20.

Regional incidence of typhus fever by types in 1940.

(British and Indian).

Type.	Northern Comd.		Eastern Comd.		Southern Comd.		Western (I) Dist.		Total.		Grand Total.
	Br.	Ind.	Br.	Ind.	Br.	Ind.	Ind.	Br.	Br.	Ind.	
OXK	4	8	9	2	1	..	..	..	14	10	24
OX19	..	8	1	..	1	1	..	..	2	9	11
OX2	..	..	3	1	2	2	..	..	5	3	8
Unclassified	..	4	4	1	5	4	..	..	9	9	18
1940	4	20	17	4	9	7	..	..	30	31	61
1939	8	19	10	4	12	19	..	..	30	42	72

11. Enteric group of fevers.

The admission ratio per 1,000 has increased from 1·1 per 1,000 in 1939 to 1·2 in 1940. This small increase is entirely due to a minor epidemic of 13 cases of paratyphoid A which occurred in Lahore District during the summer. The figures for all other Districts were most satisfactory.

Table 21 shows the decline which has taken place in this group of diseases over the last twelve years. The decreases in the admission ratios per 1,000 compared to fifty years ago are of course very much greater, and are in marked contrast to the steady persistence in incidence of the diarrhoea-dysentery group. This decline of the enteric fevers is mainly due to the production of an efficient vaccine, and to the attainment of a 100 per cent. inoculation state. It is true that the rates for 1939 and 1940 show slight regressions ; but such occasional regressions, due to small localised outbreaks, must be expected so long as the civilian reservoir for this group of fevers remains so plentifully stocked. The continued low rate over the last five years is all the more noteworthy when considered in conjunction with the fact that, owing to greatly improved methods of investigation of fevers of uncertain origin, particularly by early blood culture, the diagnosis of the enteric fevers is much more accurate than it was even ten years ago. Many cases which would have been missed in the old days are now diagnosed by early culture and prolonged incubation.

TABLE 21.

Comparative table of incidence of Enteric group fevers over 20 years.

Ratios per 1,000.

Year.	Admissions.
1913	2·3
1919—1928 (Average 10 years)	3·3
1930	3·7
1931	3·3
1932	3·4
1933	3·2
1934	1·7
1935	2·0
1936	1·5
1937	0·8
1938	0·9
1939	1·1
1940	1·2

TABLE 22.

Comparative table of types in the enteric group.

Actual admissions and deaths.

(Unclassified cases are not shown).

Years.		Typhoid.	Para.	A.	Para.	B.	Para.	C.
1935	A.	27	13		4		..	
	D.		8	..		..		..
1936	A.	14	13		1		1	
	D.		2	..		..		..
1937	A.	6	2		2		..	
	D.		3	..		..		..
1938	A.	15	2		4		..	
	D.		3	..		..		..
1939	A.	14	7		2		..	
	D.		1	..		1		..
1940	A.	13	19		..		..	
	D.		..	..		..		..

TABLE 23.

Seasonal distribution per cent. of enteric group fevers British and Indian troops.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
All India	5·6	2·4	7·9	14·3	12·7	11·9	12·7	11·1	7·9	3·9	4·8	4·8

TABLE 24.

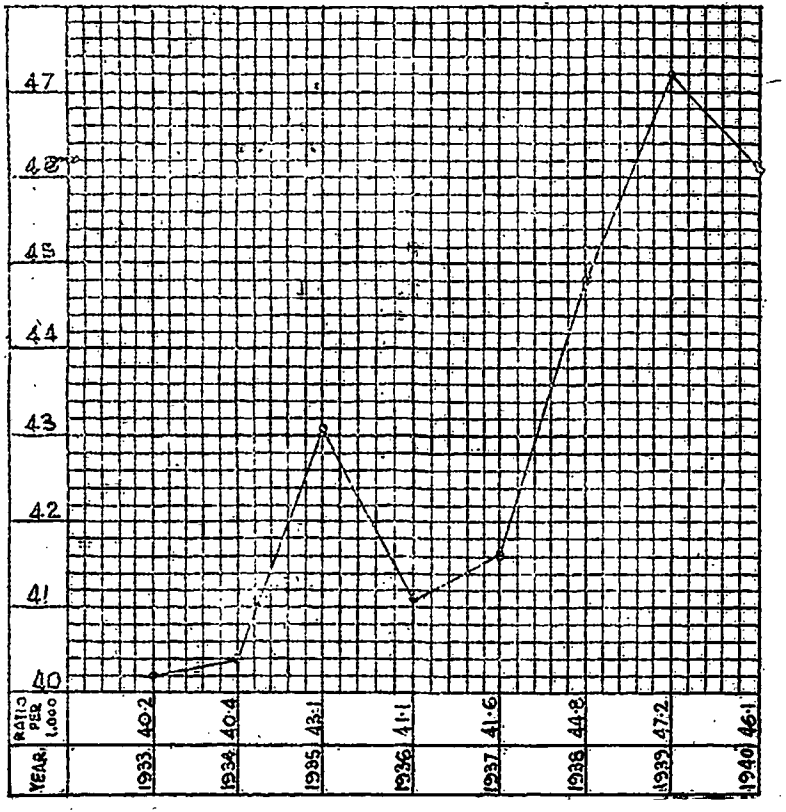
Infection rate in protected and unprotected against enteric fevers.

		Percentage.	Admission Rates per 1000.
Officers (B. S. & I. S.)	Protected	91·10	2·79
	Unprotected	8·90	37·04
British Other Ranks	Protected	98·41	1·13
	Unprotected	1·59	7·78
Women	Protected	95·83	..
	Unprotected	4·17	6·94
Children	Protected	89·83	..
	Unprotected	10·17	6·88

DYSENTERY & DIARRHOEA.

B. O. Rs. ADMISSIONS.

CHART NO. VI.



12. Dysentery, diarrhoea, colitis and amoebic hepatitis.

Compared to 1939, the admission ratio per 1,000 for this group of diseases has increased from 47·2 per 1,000 to 55·0. The most striking features in the annual curve of incidence for these diseases were two steep rises, one in April and one in August, months in which fly-breeding is at its maximum.

Northern Command at 67 per 1,000 had the highest rate ever recorded in this Command. This was largely due to an influx of cases in April and May from Operations in the Ahmadzai Salient in Waziristan. In Eastern Command a minor epidemic occurred at Agra in August due to defective fly-proofing of dining halls. No cases occurred after the fly-proofing was repaired. In an outbreak at Karachi in an infantry battalion, all companies were heavily affected except one which had a fly-proofed dining hall. Only one case occurred in this company, whereas in each of the unprotected companies the incidence was high.

TABLE 25.

The incidence of the total dysentery-diarrhoea group.

Year.	Admission ratios.
1913	18·5
1919	45·3
1925	24·3
1929	36·3
1930	40·5
1931	43·9
1932	38·2
1933	40·2
1934	40·4
1935	43·1
1936	40·7
1937	41·8
1938	44·8
1939	47·2
1940	55·0

TABLE 26.

The seasonal incidence of the dysentery-diarrhoea group.

	1938.	1939.	1940.
January	1·6	2·5	1·2
February	1·9	2·9	4·0
March	3·7	3·2	6·1
April	6·3	5·4	9·2
May	4·6	4·9	5·5
June	4·7	3·2	4·6
July	6·3	5·3	5·0
August	5·0	6·7	7·2
September	2·2	4·2	3·7
October	2·7	3·5	3·3
November	3·0	3·5	3·8
December	1·7	1·9	3·1

DYSENTERY, ALL INDIA . BRITISH TROOPS. CHART Nº VII.

MONTHLY ADMISSION RATIOS PER 1,000 OF STRENGTH.

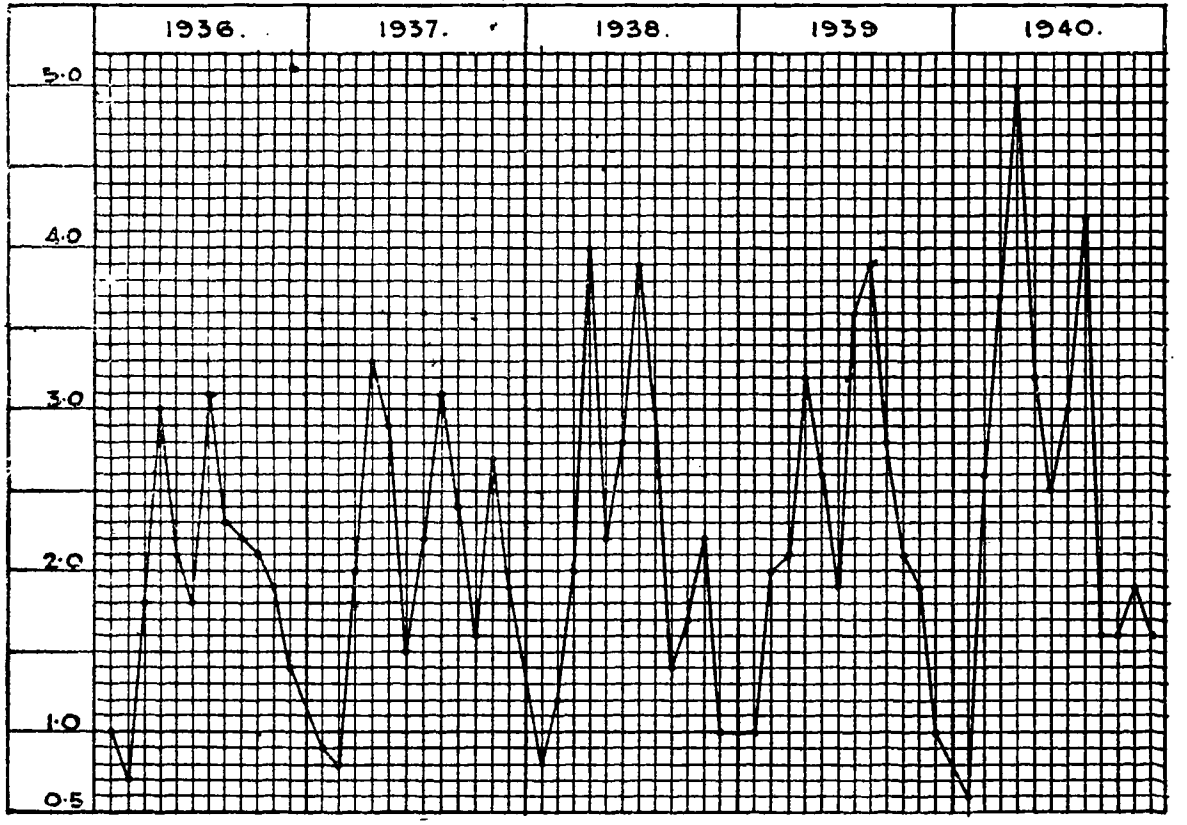


TABLE 27.

Dysentery and diarrhoea at Jhansi and Agra.

Ratios per 1,000.

Year.	Jhansi.	Agra.
1936	43·3	28·4
1937	91·5	22·7
1938	64·4	35·5
1939	83·1	41·7
1940	78·0	111·3

TABLE 28.

The incidence of dysentery, diarrhoea, colitis and amoebic hepatitis.

Ratios per 1,000.

	Dysentery.	Diarrhoea	Colitis.	Total.	Amoebic hepatitis.	Liver abscess.
1933	24·9	15·3	1·0	41·2	0·65	0·13
1934	25·5	14·9	0·8	41·2	0·96	0·09
1935	29·2	13·9	0·4	43·5	0·45	0·08
1936	24·6	16·5	0·9	42·1	0·29	0·04
1937	25·5	16·1	0·3	41·9	0·23	0·06
1938	26·8	18·0	0·2	45·0	0·53	0·07
1939	29·0	18·2	0·6	47·8	0·69	0·06
1940	33·0	25·0	0·7	58·7	0·40	0·09

TABLE 29.

Dysentery by Commands for the years 1938, 1939, 1940.

Ratios per 1,000.

	Bacillary.	Bacillary exudate.	Protozoal	Clinical.	Total.
Northern Command	11·5	2·8	1·5	5·4	21·1
	10·2	2·6	1·8	4·5	19·0
	21·9	2·6	1·5	8·5	34·6
Western (I) District	18·7	6·0	1·7	16·2	42·5
	7·8	4·1	0·5	9·2	21·5
	20·0	4·7	..	17·3	42·0
Easten Command	16·4	4·1	5·5	3·8	29·8
	23·9	3·2	4·5	5·6	37·2
	21·2	4·9	5·4	5·2	36·7
Southern Command	12·1	7·2	3·9	2·4	25·6
	22·9	3·6	2·2	5·4	34·1
	17·8	2·6	2·1	2·6	25·1

TABLE 30.

Percentage diagnosis of dysentery-diarrhoea group.

	1936.	1937.	1938.	1939.	1940.
Dysentery protozoal	10·8	10·4	12·7	9·1	8·5
Dysentery bacillary (proved)	46·1	49·3	51·3	61·6	62·0
Dysentery bacillary (exudate)	22.4	19·6	17·4	10·9	10·4
Dysentery clinical	20·7	20·7	18·5	18·4	19·1

13. Cholera.

Only one case occurred during 1940, at Bareilly. Ice-cream of doubtful origin was suspected to be the source of infection. The symptoms were typical and the case fatal.

14. Cerebro-spinal fever.

The admission ratio per 1,000 during 1940 was 0·2. All cases recovered.

15. Diphtheria.

Compared to 1939, there has been an increase from 1·8 to 2·4 ratio per 1,000, mainly due to increases in Northern and Southern Command.

TABLE 31.

Admission for diptheria over 6 years.

(*Ratios per 1,000*).

1934	1·2
1935	1·3
1936	1·3
1937	0·8
1938	1·2
1939	1·8
1940	2·4

TABLE 32.

Diphtheria by Commands in categories,

(*Ratios per 1,000*).

	British Service.				
	Northern Command.	Western (I) District.	Eastern Command.	Southern Command.	All India.
Officers	5·9	11·5	2·1	4·3	4·9
Other ranks	3·3	..	0·5	4·0	2·4
B. O. Rs. wives	..	..	..	4·0	1·8
B. O. Rs. children	4·9	..	5·1	10·5	6·5
Total 1940	3·4	0·8	0·9	4·8	2·9
Total 1939	1·7	..	2·6	3·4	2·4

16. Influenza.

Compared to 1939, the admission to hospital ratio per 1,000 of strength for Influenza has increased from 9·4 to 12·1. The incidence of this disease over the last five years is given in table 33.

TABLE 33.

Year.	Ratio per 1,000
1936	12·4
1937	16·4
1938	13·2
1939	9·4
1940	12·1

17. Poliomyelitis.

No cases occurred during 1940.

18. Small-pox.

The admission ratio per 1,000 during 1940 was only 0·4.

As will be seen from the table below, the vaccination state of the British Army in India remains at a satisfactory level.

TABLE 34.

Half yearly state of vaccination of British troops, and families.

	Percentage protected.	
	On 30th April.	On 31st October.
British officers	99·24	99·48
British other ranks	98·47	97·69
Women and children	98·51	97·32

19. Tuberculosis.

Compared to 1939, the admission ratio for all cases of tuberculosis per 1,000 of strength has increased from 1·3 to 2·4, a figure which is nearly double the average for the previous six years. The admission ratio per 1,000 for pulmonary tuberculosis was 2·2.

TABLE 35.

Incidence of Tuberculosis over the last 7 years.

(*Ratio per 1,000*).

1934	1·1
1935	1·3
1936	1·3
1937	1·4
1938	1·2
1939	1·3
1940	2·4

20. Venereal diseases.

Compared to 1939 there has been an increase of 5·7 in the admission ratio per 1,000 of strength ; which is now 25 per 1,000 greater than it was eight years ago. The position is shown in chart No. VIII. Why there should have been increases in incidence in 1939 and 1940 is surprising ; and no explanation is readily forthcoming. Since many of the soldiers in these years were young and new to India it might have been expected that the incidence would have

decreased. As a rule few British soldiers consort with Indian prostitutes until they have been a year or so in India. It seems probable that the unsettling effect of war conditions, with the ever present possibility of active service, may have led to a lowering of moral standards and of natural fastidiousness, with, as a corollary, an increase in venereal disease. The question of the prevention of venereal disease among British troops in India has always been a difficult and disappointing problem ; and there is no doubt that the main causes of the high rates throughout India have always been (*a*) the lack of social amenities outside barracks, particularly European female companionship, and (*b*) the facilities which exist in the neighbourhood of most stations for consorting with prostitutes.

The stations in India with the highest rates for venereal disease are shown in the following table :—

TABLE 36.

Station.	Ratio per 1,000.
Cawnpore	149·2
Barrackpore	105·0
Bombay	105·2
Calcutta	92·8
Dinapore	89·6
Poona	84·6
Jubbulpore	83·4
Multan	82·9
Bangalore	82·9
Delhi	78·9
Meerut	74·1
Ferozepore	66·0
Allahabad	65·6
Secunderabad	62·1
Nowshera	60·4
Sialkot	59·8
Madras	57·0
Wellington	53·0

TABLE 37.

Venereal diseases over the last 8 years.

Ratios per 1,000.

Year.	Gonorrhœa.	Syphilis.	Soft chancre.	Total venereal diseases.
1933	23·2	4·9	5·0	33·4
1934	25·2	4·5	4·1	34·1
1935	25·8	6·0	6·8	38·8
1936	25·7	4·1	4·6	34·4
1937	28·4	5·8	5·7	40·5
1938	28·0	7·6	7·9	43·5
1939	32·7	8·4	10·2	52·4
1940	30·9	12·7	14·5	58·1

CHART NO VIII

VENEREAL DISEASES.
BRITISH TROOPS
ADMISSION RATIO PER 1,000 OF STRENGTH.

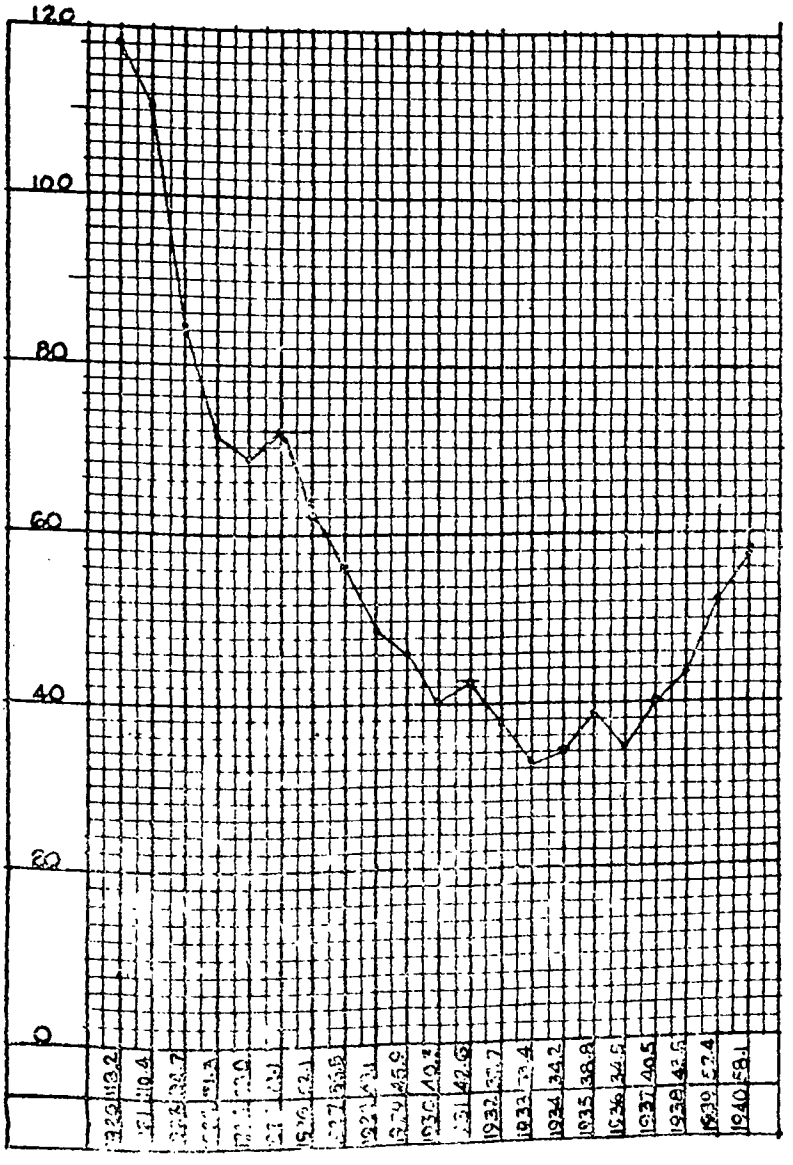
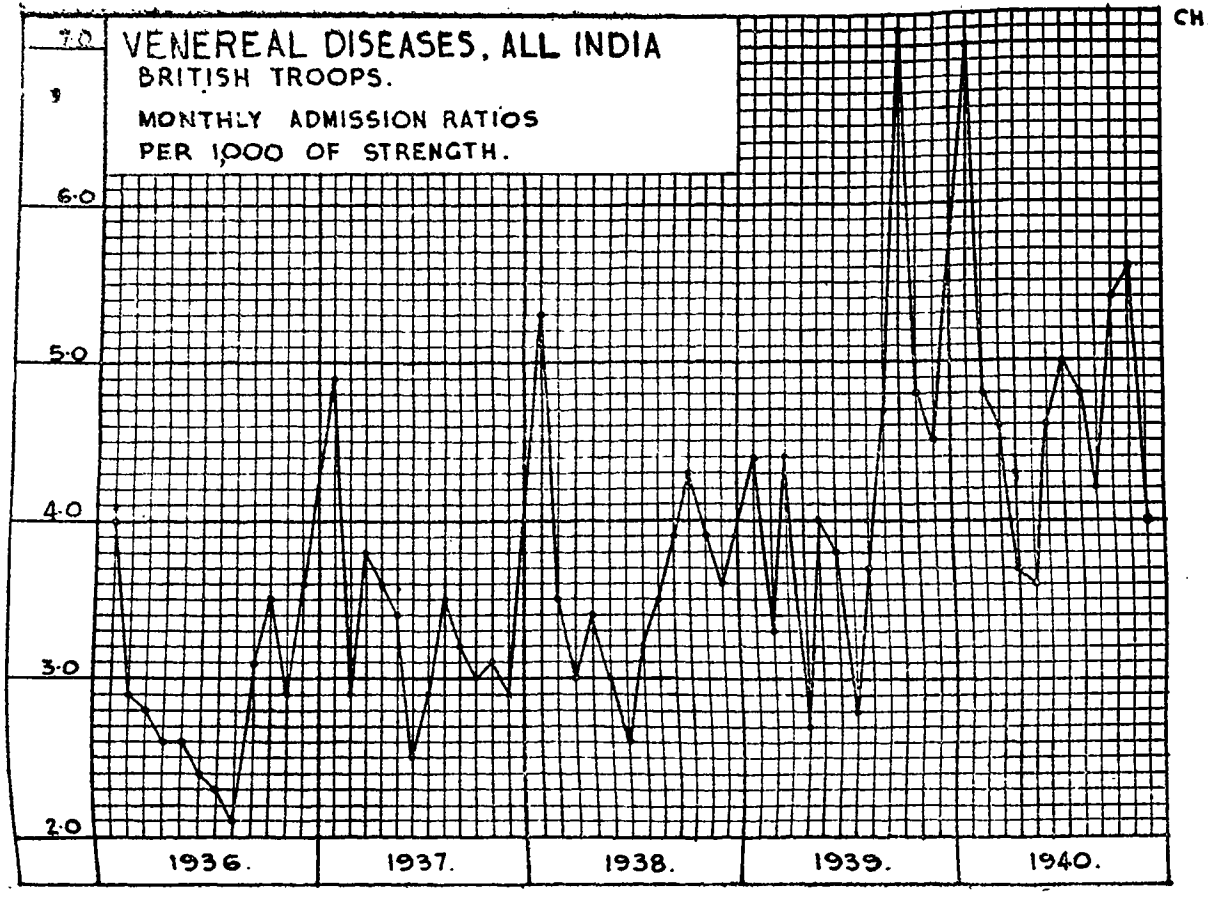


CHART NO IX.


VENEREAL DISEASES, ALL INDIA
BRITISH TROOPS.
MONTHLY ADMISSION RATIOS
PER 1,000 OF STRENGTH.
7·0
6·0
5·0
4·0
3·0
2·0
1936.
1937.
1938.
1939.
1940.

The total venereal diseases curve for all India, in Chart No. IX, shows three definite peaks—in January, July and November. The relapse rate curve is however, a low one, remaining steady month by month at about 0·5 per 1,000.

21. Diseases of the digestive system.

The admission ratio for this group of diseases has again risen appreciably, by 25·3, to the considerable figure of 148·8 per 1,000. The incidence over the past five years is shown in table 38.

TABLE 38.

1936	103·1 per 1,000.
1937	99·4 „
1938	113·6 „
1939	123·5 „
1940	148·8 „

This follows closely the rise in the dysentery-diarrhœa group; and, as far as the intestinal infections go, is dependent on similar causes, *viz.*, disturbed conditions, much travelling and camping, and the larger proportion of troops retained in the plains throughout the hot weather. Tonsillitis, which is included in this group, shows an increase from 34·4 in 1939 to 43·1 per 1,000 in 1940.

22. Respiratory diseases.

Compared to 1939, there has been an increase for the group as a whole from 25·8 to 28·7 per 1,000.

The death rate per cent of cases of pneumonia was 1·04.

In Northern Command, Waziristan District had a rate of incidence of pneumonia of 2·68 per 1,000 of strength compared to the ratio for the whole Command of 5·70. It is of interest to note that, of the British troops in Waziristan district, half spent the year in barracks at an altitude of 7,000 feet and half under canvas at an altitude of 5,000 feet.

TABLE 39.

Respiratory diseases by types.

Ratios per 1,000.

Year.	Disease of bronchi and bronchioles.	Diseases of larynx and trachea.	Pneumonia lobar and lobular.
1934	14·8	1·0	3·9
1935	15·5	1·2	4·2
1936	16·8	0·8	3·5
1937	17·2	1·3	3·2
1938	18·2	1·3	3·3
1939	19·3	1·8	4·7
1940	21·0	1·8	5·9

TABLE 40.

Monthly incidence of pneumonia group—1940.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.
Lobar pneumonia	0·6	0·1	0·1	0·3	0·3	0·3	0·2	0·3	0·2	0·2	1·4	0·6
Lobular pneumonia	0·03	0·03	0·1	0·3	0·1	0·1	0·03	0·1	0·2	0·03	0·03	0·1
Total	0·63	0·13	0·2	0·6	0·4	0·4	0·23	0·4	0·4	0·23	1·43	0·7

23. Minor septic and local injury group.

There has been the very slight reduction of 1·2 per 1,000 in the incidence of this group during 1940 compared to 1939. In spite of the attention which is now paid to the cleansing and dressing of minor cuts and abrasions, this group shows no sign of any reduction over the last ten years. The highest rate, as usual, is in Northern Command. This is due to the fact that, of the five Districts in this Command, three are situated on the North-West Frontier. As a result, large number of troops are continually under semi-active service conditions.

TABLE 41.

Minor septic and local injury over the past 10 years.

Ratio per 1,000.

Year.	Minor septic.	Local injury.	Total.
1930	52·7	58·9	111·6
1931	59·0	61·7	120·7
1932	56·2	58·5	114·7
1933	58·1	60·2	118·3
1934	57·9	62·3	120·2
1935	59·7	62·2	121·9
1936	59·5	61·6	121·3
1937	54·6	57·6	112·2
1938	59·2	62·7	121·9
1939	66·9	63·0	129·9
1940	70·1	58·6	128·7

TABLE 42.

The incidence of boils over the last 5 years.

Year.	Ratios per 1,000.
1936	9·1
1937	7·3
1938	7·7
1939	8·2
1940	7·4

24. Effects of heat.

Compared to 1939, there has been an increase in the admission ratio of effects of heat per 1,000 of strength from 2·3 to 6·1. Heat stroke shows an increase from 0·4 to 1·2 and heat exhaustion from 1·9 to 4·9. These increases were in the main due to a marked increase for admissions for effects of heat which occurred in Northern Command. In this Command, apart from sporadic cases which occurred throughout the hot weather, two definite outbreaks were reported from Lahore District (one at Multan and one at Ferozepore).

In the Multan outbreak 22 cases occurred between 22nd June 1940 and 18th July 1940, all from one unit. Ten were young soldiers experiencing their first hot weather. The weather was hot but not unduly so for the time of year; humidity was, however, rather higher than usual. The standard of fitness of the unit was low and the men were shut up in their barrack rooms from 9 A.M. to 5-30 P.M. each day. Reveille was also too early, being, on days when firing on the ranges took place, at 5 A.M. In the Ferozepore outbreak 36 cases occurred between 1st July 1940 and 11th July 1940, all from the same unit. Only 5 of the cases had less than one year's service. The weather was hot but not hotter than usual for early July; humidity was, however, above the average. There had been a fall of 1·34 inches of rain on 28th June 1940, and most of the cases occurred in the next few days. The standard of fitness of the unit was average, but the men were shut up in barrack-rooms from 9 A.M. to 5-30 P.M. each day. Reveille was also too early. It is worth recording that no cases of effects of heat occurred among the personnel of another similar unit in Ferozepore which had a later reveille but who were kept doing work, mainly manual, outside their barrack-rooms up to mid-day. In this connection it is also interesting to note that among the British troops who were engaged in operations on the N.-W. Frontier in May 1940, when the maximum temperature was constantly at 115°F, there was only 10 cases of heat exhaustion and none of heat stroke. These troops were living under canvas, and working in the open all day.

TABLE 43.

Effects of heat.

(Ratio per 1,000.)

	Heat stroke.		Heat exhaustion.		Total effects of heat.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1936 .	0·2	0·06	0·7	0·02	0·9	0·08
1937 .	0·3	0·13	0·8	0·04	1·1	0·17
1938 .	0·5	0·14	1·5	0·12	2·0	0·26
1939 .	0·4	0·06	1·9	0·06	2·3	0·12
1940 .	1·2	0·06	4·9	0·15	6·1	0·21

TABLE 44.

Seasonal incidence of heat effects (British troops).

	Jan. A.D.	Feb. A.D.	Mar. A.D.	May. A. D.	Apr. A. D.	June. A. D.	July. A. D.	Aug. A. D.	Sep. A. D.	Oct. A.D.	Nov. A.D.	Dec. A.D.
Heat stroke	....	....	....	.. ..	0·10·03	0·80·03	0·40·03	.. ..	·03	.. ....	....	....
Heat exhaustion	....	....	....	0·2 ..	0·4 ..	1·80·11	1·8 ·03	·03 ..	0·1 ..	....	....	....

25. Mental diseases.

Compared to 1939 there has been an increase in the numbers admitted for mental diseases per 1,000 of strength from 2·9 to 3·2. This figure is a little above the average of the six previous years.

TABLE 45.

Admission for mental diseases.

(Ratios per 1,000.)

Year.	Admissions.	Invalided.
1934	2·8	1·23
1935	3·3	1·01
1936	2·8	1·88
1937	2·5	1·54
1938	2·5	1·51
1939	2·9	1·60
1940	3·2	1·40

26. Scabies.

Compared to 1939, there has been a reduction of 0·5 in the admission ratio per 1,000 of strength, to give, at 1·7, a figure which is about the average of the last six years.

TABLE 46.

Scabies.

Ratio per 1,000.

1935	1·4
1936	1·7
1937	1·4
1938	1·9
1939	2·2
1940	1·7

27. Cysticercosis and the worm infestations.

No case of cysticercosis occurred during 1940. At Quetta six cases of infestation with T. saginata were reported. Following this, special methods of beef inspection were instituted and a large quantity of infested meat was found

in bazaar markets. The meat supplied by the R. I. A. S. C., on the other hand, was invariably found to be of good quality.

28. Other diseases.

Abortus fever.

Two cases occurred at Chakrata. It was considered that both cases had been infected by drinking unsterilized milk while on a railway journey from Jhansi to Chakrata.

Psittacosis.

One case was diagnosed at Murree. The physical signs were :—patchy pneumonia, slow pulse, slow respiration and a typhoid state. All blood, fæcal and urinary cultures were negative for the enteric group ; and all agglutination tests inconclusive. The patient had recently been in contact with sick parrots and budgerigars.

Coronary thrombosis.

Three cases occurred in middle-aged persons unaccustomed to strenuous exertion in the hills, who were undergoing special training at Murree.

29. Invaliding.

Compared to 1939, the number of British other ranks invalided out of India per 1,000 of strength has decreased by 2·33 to 6·81 which is the lowest figure recorded for at least eleven years. The reason for this very low rate is partly because only those cases whose complete recovery is considered to be impossible in India are now invalided out of India. In former years many cases, of a type who now complete their recovery satisfactorily in India, were evacuated to the United Kingdom.

TABLE 47.

Invaliding.

Ratios per 1,000.

1930	8·70
1931	9·76
1932	7·39
1933	9·15
1934	9·39
1935	6·90
1936	10·99
1937	10·97
1938	9·35
1939	9·14
1940	6·81

TABLE 48.

Principal diseases causing invaliding.

	Ratios per 1,000.
Pulmonary tuberculosis	1·77
Mental diseases	1·40
G. S. W. (in action)	0·43
Other diseases of bones and muscles	0·19
Nephritis	0·19
Rheumatic fever	0·18
Inflammation of valves of heart	0·18
Other nervous diseases	0·12
Asthma	0·12
Dermatitis	0·12
Other diseases of urinary organs	0·12
Diseases of the spinal cord	0·09
Convulsions	0·09
Otitis media	0·09
Disordered action of heart	0·09
Gastric ulcer	0·09
Duodenal ulcer	0·09
Fractures	0·09
New growth, malignant	0·09

30. Deaths.

Compared to 1939, the number of deaths per 1,000 of strength shows, at 2·77, the very slight increase of 0·02 per 1,000.

The principal causes of death during 1940 are shown in table 49.

TABLE 49.

Local injuries (including 22 G. S. W.)	1·10	per 1,000.
General injuries	0·60	„
Other blood diseases	0·12	„
Pneumonia	0·06	„
Diphtheria	0·06	„
Dysentery bacillary	0·06	„
T. B. pulmonary	0·06	„

31. Women and children.

As will be seen in tables 50 and 51, the admission rates for women and children have increased appreciably in 1940 compared to former years.

The commonest diseases among women were those of the generative and digestive systems. Amongst children, however, the dysentery-diarrhœa group, as usual, is the most common and the most fatal disease.

In Western (Independent) District there was sharp rise in admissions, due mainly to malaria at Karachi, scarlet fever at Quetta and the dysentery-diarrhœa group at both stations.

The general health of women has been good in Eastern Command although the admission ratio, at 303 per 1,000 is higher than the three previous years.

Meerut district in contrast to Lucknow and P. and A. districts shows a marked fall in admission.

Northern Command has had an increase in admission ratios of 45 per 1,000 for women and 13 per 1,000 children. Death rates are below the average ; and there have been *no* deaths among women in Kohat or Peshawar Districts for the last 4 years.

The admissions, deaths and invaliding for women are shown in table No. 50.

TABLE 50.

British other ranks' wives.

Ratios per 1,000.

Years.	Admissions.	Deaths.	Invaliding.
1931	334·4	5·75	17·02
1932	292·3	4·17	13·20
1933	313·2	2·75	11·45
1934	311·6	2·23	12·50
1935	312·4	3·35	9·33
1936	337·6	3·21	10·85
1937	319·7	3·62	10·13
1938	311·8	3·84	9·99
1939	263·9	0·83	5·54
1940	349·6	2·67	3·00

The principal causes of admission were :—

Malaria	100	
Affection connected with pregnancy (other than abortion)	84	
Abortion	66	
Other disorders peculiar to women	55	
Tonsillitis	41	
Dysentery	38	75
Diarrhœa	37	
Cellulitis	28	
Appendicitis	23	
Displacement and distortion of uterus	22	
Other disorders of urinary organs	22	
Bronchitis	20	
Cystitis	19	
Diseases of mucous membrane	18	
Endometritis	16	
Gastritis	15	
Influenza	14	
Menorrhagia	14	
Common cold	13	
Pneumonia	12	
Constipation	11	
Jaundice	11	
Other diseases of digestive system	11	
Anæmia	10	
Colic	10	
Myalgia	10	

The admissions, deaths and invaliding for children are shown in the table No. 51.

TABLE 51.

British other ranks' children.

Ratios per 1,000.

Year.	Admissions.	Deaths.	Invaliding.
1930	284·4	12·29	0·92
1931	286·4	12·08	3·32
1932	299·1	12·72	2·09
1933	281·9	11·05	1·42
1934	299·6	11·83	2·31
1935	334·3	9·66	2·15
1936	335·4	13·40	3·23
1937	358·3	12·83	2·60
1938	353·4	9·75	2·74
1939	374·1	12·30	3·41
1940	375·1	14·82	..

The principal causes of admission to hospital were :—

Dysentery	161
Tonsillitis	137
Bronchitis	129
Diarrhœa	120
Malaria	105
Hypertrophy of tonsils	71
Cellulitis	48
Common cold	39
Measles	39
Pneumonia	36
Constipation	29
Diphtheria	27
Conjunctivitis	25
Enteritis	23
Jaundice	22
Otitis media	18

The principal causes of death were :—

Dysentery 10, pneumonia 7 and enteritis 6. Thirty-one per cent. of deaths were due to the dysentery-diarrhoea-enteritis group.

PART I

SECTION II

ON THE HEALTH OF THE INDIAN ARMY.

PART I.

SECTION II.

On the health of the Indian Army.

32. General.

The general health of the personnel of the Indian Army has not been so good as in 1939 or in the years immediately preceding 1939. At the same time, considering that intensive training was in force, that there was a great deal of unavoidable overcrowding and that an unusually large proportion of the troops consisted of elderly reservists and youthful recruits, the health of the Indian Army during 1939 can be considered to have been satisfactory.

For officers there has been a very slight increase, from 462·1 to 466·4, in the admission to hospital ratio per 1,000 but a decrease, from 14·75 to 13·25, in the average constantly sick ratio per 1,000.

For other ranks, compared to 1939, there has been an increase of 95·00 in the admission to hospital ratio per 1,000 of strength, giving a figure for 1940 of 549·00. The average constantly sick ratio per 1,000 has increased from 16·25 to 17·51 per 1,000.

For followers there has been an increase of 103·00 in the admission to hospital ratio, to give a figure of 426·20 per 1,000; while the average constantly sick ratio per 1,000 has increased from 11·45 to 13·28.

TABLE 52.

General health statistics of the Indian troops in India during the year 1940 Ratios per 1,000 of strength.

	Admissions.	Deaths.	Invalids sent to United Kingdom.	Invalids discharged in India.	Constantly sick.
Officers . . .	466·4	5·17	2·33	..	13·25
I. O. Rs. . .	549·0	2·11	..	11·86	17·51
Non-Combatants (enrolled) . .	426·2	2·50	..	6·05	13·28

TABLE 53.

Quinquennial comparative table of sickness for officers and other ranks ratio per 1,000.

Period.	Admissions.		Invalids.		Deaths.	
	King's commissioned officers.	Indian ranks.	King's commissioned officers.	Indian ranks.	King's commissioned officers.	Indian ranks.
1925-29	498·0	385·6	5·22	10·8	4·74	3·48
1930-34	336·7	453·3	12·47	6·55	5·37	2·63
1935-39	383·8	423·3	10·72	5·76	6·05	2·08
1940 .	466·4	549·0	2·33	11·86	5·17	2·11

TABLE 54.

Annual comparative table of sickness for officers and other ranks. Ratio per 1,000.

Period.	Admissions.		Invalids.		Deaths.	
	King's commissioned officers.	Indian ranks.	King's commissioned officers.	Indian ranks.	King's commissioned officers.	Indian ranks.
1936 .	364·3	426·5	5·34	5·52	4·37	2·16
1937 .	359·0	391·7	9·23	5·49	4·35	1·77
1938 .	386·8	421·8	19·86	5·83	10·40	2·21
1939 .	462·1	454·0	12·36	6·43	3·84	2 21
1940 .	466·4	549·0	2·33	11·86	5·17	2·11

33. Principal interesting features of 1940.

The most interesting features of 1940 have been :—

(*a*) The effect which a war waged outside India had on the sick rate of Indian troops in India.

(*b*) The high rate of admissions for malaria.

(*c*) The relatively low rate of admissions for sandfly fever.

(*d*) The high rate of admissions for the dysentery-diarrhoea group.

(*e*) The continued low rate of admissions for fevers of the enteric group.

(*f*) The introduction of the blood-grouping of all recruits.

34. Factors which have affected the health of the troops.

The marked increase in admissions to hospital per 1,000 of strength is considered to have been due, although indirectly, to the war with Germany.

(*a*) The composition of the Indian Army was altered. The healthy well-disciplined mature Indian soldiers were diluted by old reservists, young recruits, Territorial and State Forces. All these arrived infected with malaria ; and not only swelled the sick rate but provided a well stocked reservoir of infection from which the disease could be passed on to others.

(*b*) Overcrowding was temporarily common in most stations, particularly in training units. As a result, outbreaks of such diseases as measles, mumps, cerebro-spinal fever and common colds occurred.

(*c*) Young recruits are more liable to contract disease than men in the prime of life ; while all newcomers to the army are more liable to feel the strain of intensive training than the well hardened pre-war regular soldier.

(*d*) Owing to expansion, there was a shortage of space inside cantonments which necessitated camps in malarious areas outside.

(*e*) Conditions of internal security demanded that guards should be found for road and railway bridges, often in intensely malarious districts.

(*f*) Owing to the rapid turn-over of medical officers, continuity of sanitary, particularly anti-malaria, control was impared.

(*g*) Regimental officers were not as experienced as were their predecessors of 1938 to 1939 in looking after their men.

(*h*) The men themselves were not so well versed in the elements of sanitation.

(*i*) The maximum expansion occurred in the summer and autumn, so that a large number of troops were exposed to the most unhealthy part of the year without the compensation of a proportionately increased annual average strength.

35. Officers.

The steady upward tendency shown by the admission to hospital ratio for officers over the past ten years has been maintained, though slightly during 1940. It is however, at 466·4, still lower than the quinquennial ratio for 1925-29 (see table 53). The average constantly sick ratio per 1,000 has decreased from 14·75 to 13·25, while the ratio for invaliding has decreased from 12·36 to 2·33 per 1,000. The ratio of deaths per 1,000 has increased from 3·84 to 5·17 per 1,000.

The principal causes of sickness during 1940 are shown in table 55.

TABLE 55.

Principal causes of sickness for officers.

Diseases.	Ratio per 1,000.	Increase or decrease as compared with 1939.	
		Increase.	Decrease.
Digestive diseases other than tonsillitis, appendicitis and diarrhoea	78·9	3·9	..
Local injuries	48·9	..	8·2
Malaria	47·9	10·0	..
Minor septic diseases	31·8	7·1	..
Sandfly fever	16·0	..	6·6
Diseases of the ear and nose	18·8	..	2·0
Diarrhœa	24·6	3·7	..
Tonsillitis	22·8	2·3	..
Dysentery	27·9	12·1	..
Respiratory diseases	18·1	1·5	..
Appendicitis	9·0	..	5·9
Diseases of bones, joints, muscles, faciae and bursae	12·2	..	2·7
Influenza	13·5	1·6	..
Urinary diseases	9·3	..	0·9
Common cold	9·8	1·7	..

36. Indian other ranks.

There has been a marked rise in the admission to hospital ratio per 1,000 to give at 549·00 a figure considerably about any shown by the quinquennia periods since 1925. This increase has been common to all Commands. The average constantly sick ratio per 1,000 has increased from 16·25 to 17·51 per 1,000, an increase which was shared by all Commands.

The average sick time to each soldier was 6·41 days and the average duration of each case of illness was 11·68 days compared with 5·93 and 13·06 respectively in 1939.

TABLE 56.

Principal causes of admission to hospital.

Diseases.	Ratio per 1,000.	Increase or decrease as compared with 1939. Increase.	Decrease.
Malaria	173·2	54·9	..
Local injuries	45·8	..	11·2
Minor septic diseases	36·1	..	0·7
Pharyngitis	17·5	..	6·6
Dysentery	22·3	5·2	..
Common cold	24·7	9·0	..
Bronchitis	15·2	2·0	..
Scabies	16·8	4·9	..
Venereal diseases	18·9	10·4	..
Conjunctivitis	7·9	0·6	..
Mumps	9·3	2·3	..
Diarrhoea	10·9	4·6	..
Ankylostomiasis	6·0	..	0·2
Sandfly fever	5·9	..	0·1
Tonsillitis	5·0	..	0·5
Pneumonia (lobar and lobular)	8·3	2·9	..
Dermatitis	4·7	..	0·4
Indigestion	6·9	2·4	..
Constipation	3·2	..	0·8
Tineas	3·4	..	0·4
Influenza	5·1	1·4	..
Otitis media	3·2	..	0·2
Synovitis	3·0	..	0·1
Myalgia	3·5	0·6	..
Jaundice	4·3	0·9	..
Eczema	3·2	0·8	..
Anaemia, secondary	2·2	..	..
Appendicitis	1·6	..	0·5
Trachoma	1·5	..	0·6
Pulmonary tuberculosis	2·2	0·3	..
Rhinitis and coryza	5·5	2·2	..
Piles	2·8	1·0	..
Pleurisy	2·0	0·3	..
Dracontiasis	2·8	1·2	..
Colic	1·6	0·1	..
Lumbago	1·5	0·1	..
Renal colic	1·5	0·1	..
Sciatica	1·6	0·4	..
Urethritis	1·7	0·9	..

Barrack treatment.

The number of men under barrack treatment (out-patients) was 1,471·6 per 1,000 compared with 1,296·5 in 1939. The combined ratio of constantly sick in hospital plus those constantly under treatment in barracks was 36·39 per 1,000 compared to 34·60 in 1939.

RATIOS PER 1,000 ADMITTED TO HOSPITALS, INVALIDS, CONSTANTLY SICK, AND AVERAGE SICK TIME TO EACH SOLDIER FROM 1921 TO 1940 (INDIAN TROOPS)

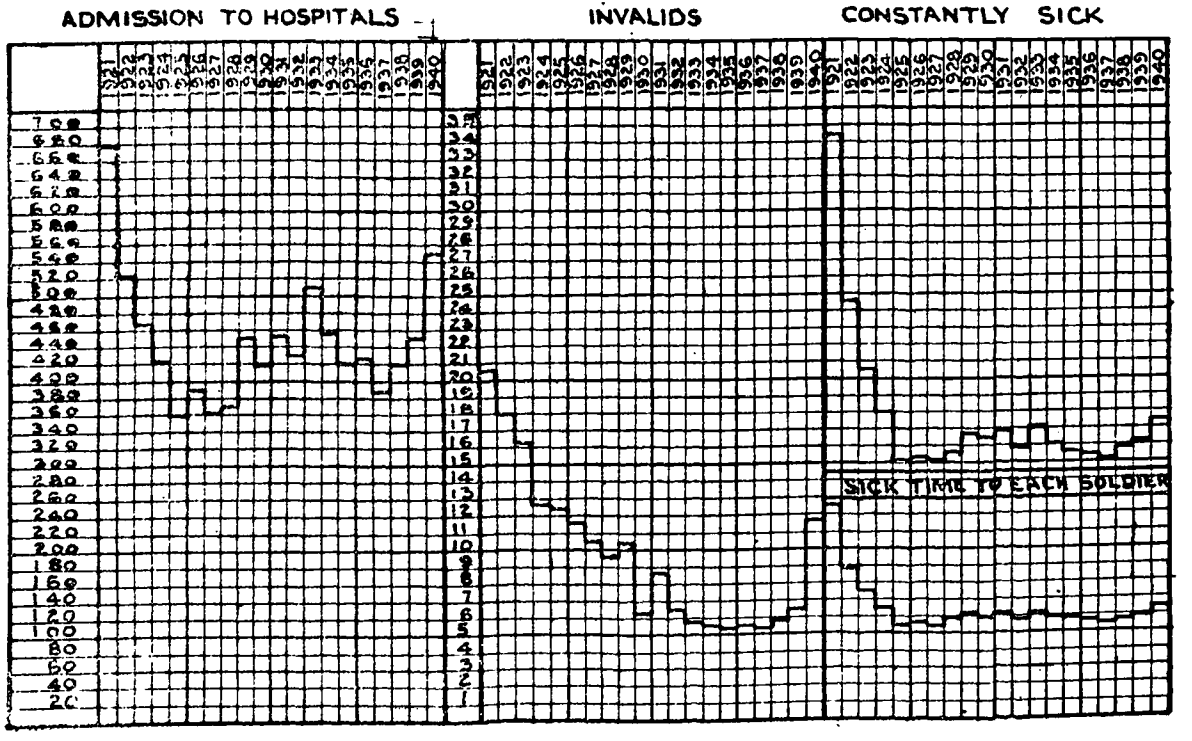
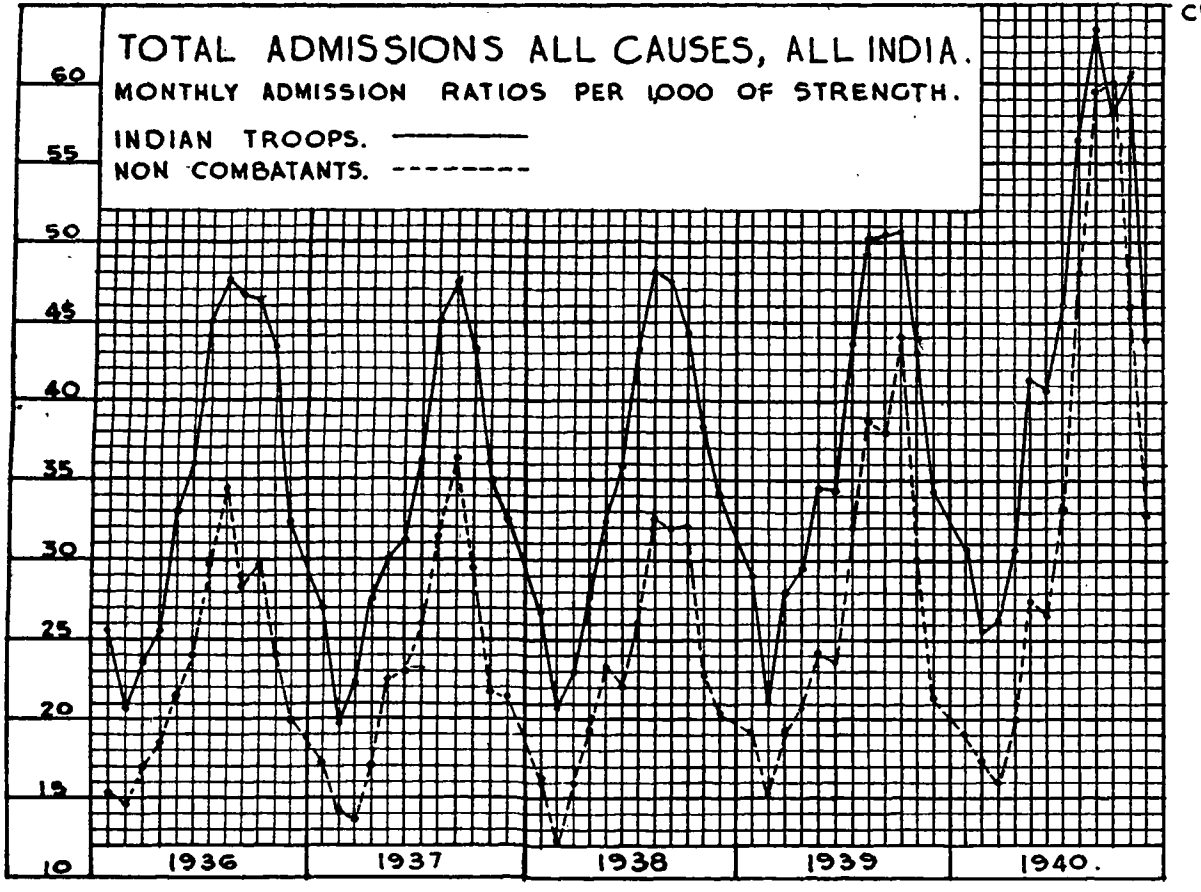


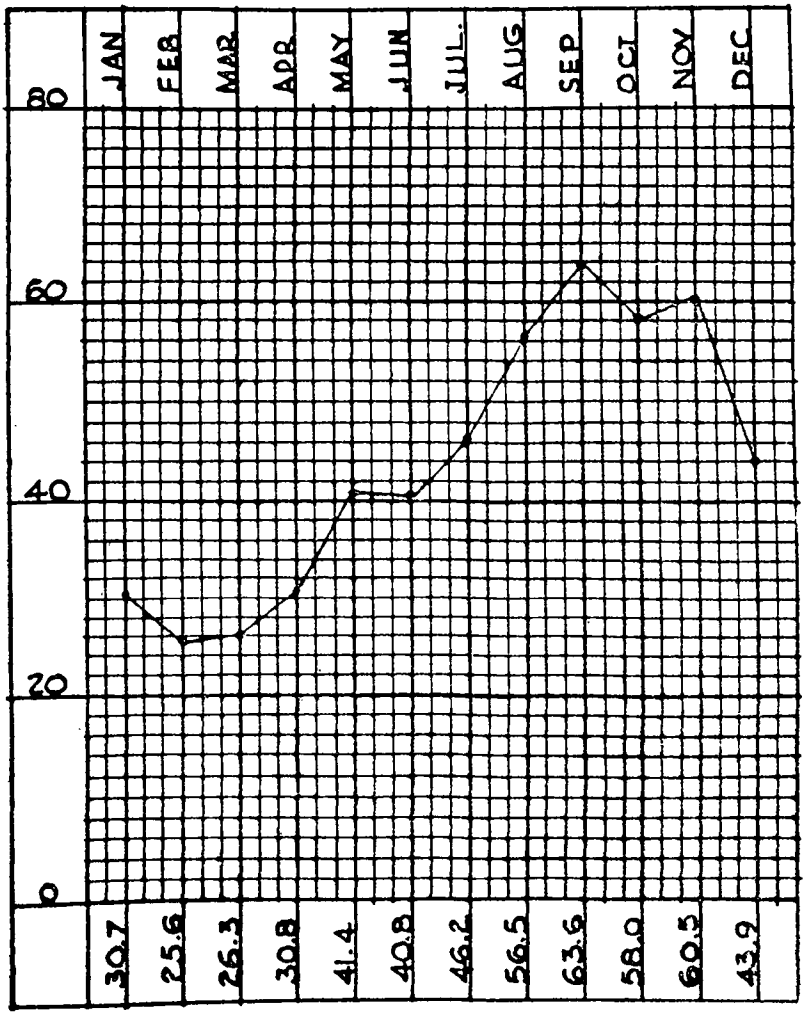
CHART Nº XI.


TOTAL ADMISSIONS ALL CAUSES, ALL INDIA.
MONTHLY ADMISSION RATIOS PER 1000 OF STRENGTH.
INDIAN TROOPS.
NON COMBATANTS.
60
55
50
45
40
35
30
25
20
15
10
1936
1937
1938
1939
1940.

The graph given below shows the general trend of sickness throughout the year.

CHART No. XII

TOTAL ADMISSIONS ALL CAUSES,
ALL INDIA. 1940
INDIAN TROOPS.
RATIO PER 1,000 OF STRENGTH.



TABLE

Table showing total admissions and deaths ratios per 1,000 of the strength for all

Stations with total admission ratios, all causes, higher than all India

	Dehra Dun.	Razmak.	Poona.	Ferozepore.	Kohat.	Sialkot.	Jhansi.	Jubbulpore.	Bannu.	Meerut.	Rawalpindi.
All Causes—											
Admissions	72·3	770·5	706·5	692·3	667·8	644·2	646·8	618·7	594·2	591·6	678·5
Deaths	4·07	10·05	1·63	2·47	1·35	1·71	1·63	0·42	3·46	1·54	1·66
A. C. Sick	26·05	24·11	17·97	20·17	20·16	15·75	21·93	25·46	14·75	20·60	23·70
Malaria—											
Admissions	213·3	368·9	227·3	209·3	294·2	153·3	111·5	177·4	255·3	246·7	163·0
Deaths	0·29	0·16	..	..	..	..	..	..	..	..	..
Sandfly fevers—											
Admissions	..	37·8	..	21·4	20·2	9·4	..	6·9	11·8	..	5·5
Deaths	..	..	..	..	..	..	..	..	..	..	..
Enteric group of fevers—											
Admissions	..	..	0·2	1·6	0·8	1·4	0·3	1·0	0·8	0·6	1·6
Deaths	..	0·16	..	..	..	0·57	..	..	..	..	0.14
Dysentery—											
Admissions	12·2	29·8	27·4	23·0	25·4	11·4	52·5	29·4	41·3	14·2	28·9
Deaths	..	..	..	0·27	..	..	..	..	..	..	..
Diarrhœa—											
Admissions	5·5	4·1	20·9	6·9	6·2	26·8	11·7	4·0	7·2	8·6	25·0
Deaths	..	..	..	..	..	..	..	..	..	..	..
Influenza—											
Admissions	0·3	..	..	3·6	3·7	..	29·7	0·2	..	5·2	2·9
Deaths	..	..	..	..	..	..	..	..	..	..	..
Pneumonia lobar and lobular—											
Admissions	18·3	5·6	8·5	21·4	7·3	16·8	6·5	3·6	5·8	8·0	10·2
Deaths	1·16	..	0·65	..	..	..	..	..	..	0·62	..
Minor septic diseases—											
Admissions	72·7	33·2	37·0	54·1	22·1	55·3	50·6	47·6	19·3	30·5	42·2
Deaths	..	..	..	..	..	..	..	..	..	..	
e nereal diseases—											
Admissions	10·5	5·6	61·0	12·4	8·4	8·5	11·1	29·6	6·0	26·5	17·6
Deaths	..	..	..	..	..	..	..	..	..	..	..
Local injuries—											
Admissions	69·0	74·2	58·1	70·3	55·2	42·5	77·6	57·9	54·1	40·3	44·2
Deaths	..	8·46	0·33	0·27	..	0·28	0·98	..	2·82	0·62	0·14
Heat stroke—											
Admissions	..	..	..	0·3	..	..	..	..	..	..	..
Deaths	..	..	..	0·27	..	..	..	..	..	..	..
Heat Exhaustion—											
Admissions	..	..	..	1·4	0·3	..	..	..	0·3	..	0·3
Deaths	..	..	..	..	..	..	..	..	..	..	..

57.

causes and certain important diseases for the larger stations compared with all India.

Stations with total admission ratios, all causes, lower than all India.

All India.	Delhi.	Karachi.	Lahore.	Ambala.	Roorkee.	Lucknow.	Bareilly.	Bangalore.	Secunderabad.	Wana.	Quetta.
549·0	548·3	521·8	523·4	519·0	490·6	474·8	480·6	407·6	400·0	377·4	349·2
2·11	2·63	3·16	1·90	0·22	0·31	3·33	1·53	0·96	2·46	1·30	1·90
17·51	19·63	113·70	16·58	17·57	12·55	21·28	17·61	17·86	15·25	13·55	17·63
173·2	148·6	167·9	147·4	143·5	109·4	70·8	107·7	33·0	59·5	166·4	120·9
0·09	..	..	..	..	..	..	..	0·19	..	..	..
5·9	1·0	0·9	2·4	..	..	..	0·3	..	0·2	0·5	1·6
..	..	..	..	..	..	..	..	..	..	..	..
0·7	0·3	0·6	1·8	0·7	0·6	0·9	1·2	1·2	0·4	1·1	0·4
0·05	..	..	..	..	..	..	..	..	..	..	..
22·3	10·9	11·3	26·8	9·9	19·9	43·5	33·7	24·1	47·7	17·4	14·0
0·02	..	..	..	0·22	..	..	..	..	..	..	..
10·9	21·7	10·8	15·4	15·0	5·0	3·6	21·1	9·4	9·4	1·0	8·7
..	..	..	..	..	..	..	..	..	..	..	..
5·1	0·7	0·3	0·8	..	..	0·3	0·9	..	6·5	1·6	..
..	..	..	..	..	..	..	..	..	..	..	..
8·3	7·9	7·0	11·6	9·5	6·3	8·9	9·8	2·9	4·0	3·1	6·8
0·29	0·33	0·63	0·20	0·22	..	0·55	0·31	..	0·22	..	0·63
36·1	42·1	27·8	56·3	46·9	61·0	33·9	32·6	31·5	29·5	22·7	11·9
0·01	..	..	..	..	..	..	..	..	..	..	..
18·9	21·7	13·6	17·0	21·9	10·4	33·6	16·2	60·9	21·0	4·2	21·4
0·01	..	..	..	..	..	..	..	..	..	..	0·16
45·8	56·2	20·9	40·6	40·0	44·7	48·0	39·5	58·6	38·0	35·7	27·8
0·76	0·99	1·58	0·20	0·22	..	0·55	0·31	0·38	1·12	0·78	0·16
0·03	..	..	..	..	..	0·3	0·3	..	..	..	..
0·02	..	..	..	..	..	..	..	..	..	..	..
0·3	..	..	..	..	..	..	..	..	..	0·3	..
..	..	..	..	..	..	..	..	..	..	..	..

Principal diseases affecting Indian other ranks.

37. Malaria.

Compared to 1939, the admissions to hospital ratio per 1,000 of strength has increased from 118·3 to 173·2. This increase was common to all Commands, but was heaviest in Northern where a ratio per 1,000 of 209·83 was reached.

The reasons for this very high rate of incidence of malaria were probably the following unusual factors, all favourable to the propagation of malaria and all simultaneously present in 1940 :—

(*a*) The great influx of infected recruits, reservists, Territorials, State Forces and Nepalese into the Army.

(*b*) The fact that the maximum expansion took place at the most malarious part of the year.

(*c*) Exposure during the malaria season of troops on railway protection duty.

(*d*) The occupation of camps in malarious areas outside cantonments.

(*e*) An autumn generally more favourable than usual for mosquito breeding.

(*f*) Shortage for a time of mosquito nets.

(*g*) Lack of continuity of unti-malaria pesronnel ; and, to some extent, lack of trained personnel.

(*h*) The inexperience of junior unit officers and the absence of anti-malaria knowledge among other ranks (*e.g.*, bad net discipline).

(*i*) The occurrence of Ramzan during the malaria season.

(*j*) The incomplete treatment of sub-clinical cases among other ranks ; and the presence of numerous men from various parts of India with a personal tolerance to their own strain of parasites but who were a source of infection to others.

As is well known, Indian troops are subject to factors in the causation of malaria which do not influence British troops. These in brief are :—

(*a*) The great majority of Indian recruits are already infected on enlistment.

(*b*) Many have acquired tolerance ; and suffer from frequent slight relapses which usually cause them relatively little inconvenience but which on occasion flare up into clinical cases.

(*c*) The superimposition of fresh infection upon existing sub-clinical malaria when on leave at their homes.

Assuming this to be correct, it follows that one of the most important means of reducing the incidence of malaria among Indian troops would be to detect and treat these sub-clinical cases. With this object in view the Deputy Director of Medical Services, Northern Command in March 1939 issued instructions that every I. O. R. in his Command returning from leave and every recruit

on joining should be medically examined, and that all those with enlarged spleen or giving a history of fever (the bloods of all doubtful cases being examined microscopically) should receive as out-patients a full therapeutic course of treatment by atebrin (or quinine) and plasmoquine. This line of action seemed to give most promising results in 1939 in reducing the incidence of malaria. It was, however, found to be impossible to continue it during 1940 owing partly to administrative difficulties connected with the great influx of recruits and partly to a shortage of medical officers. The question, is, however, under examination at present; and it is possible that the treatment of all sub-clinical cases may be introduced for the whole Indian Army in 1941.

The District producing the highest admission incidence in India during 1940 was Waziristan, with a ratio per 1,000 of 320·24. This was nearly double the ratio for 1939. This very high rate was attributed to :—

(*a*) An epidemic among the civil population of Waziristan.

(*b*) Operations in the Daur country at the peak of the malaria season.

(*c*) The manning of a large number of picquets in the notoriously malarious Khajuri and Shinki country.

(*d*) Frequent columns and minor operations.

(*e*) The impossibility of carrying out anti-larval work owing to hostile action.

TABLE 58.

Annual admission for malaria—Indian troops.

Over 12 years. Ratio per 1,000.

Year.	Admission.	Invaliding.	Deaths.
1929	175·3	0·22	0·15
1930	153·4	0·06	0·13
1931	149·4	0·08	0·10
1932	145·1	0·07	0·10
1933	212·2	0·05	0·06
1934	156·5	0·06	0·05
1935	125·9	0·03	0·08
1936	123·1	..	0·07
1937	97·9	..	0·04
1938	109·5	0·04	0·05
1939	118·3	0·02	0·04
1940	173·2	0·08	0·09

TABLE 59.

(V. C. Os. and I. O. Rs.)

Admission and deaths for malaria by commands.

		Ratio per 1,000. Admissions and deaths.			
		B. T.	M. T.	Quartan.	Clinical.
Northern Command	A. ..	130·1	65·9	0·2	9·0
	D. ..	..	0·05	..	..
Western (I.) District	A. ..	119·8	18·7	0·3	24·2
	D. ..	..	0·06	..	..
Eastern Command	A. ..	87·2	34·0	0·2	18·5
	D. ..	..	0·13	..	..
Southern Command	A. ..	91·6	21·9	0·3	6·1
	D. ..	..	0·14	..	..
All India	A. ..	111·6	45·4	0·3	12·0
	D. ..	..	0·09	..	..

The principal stations in which admissions for malaria, ratio per 1,000, were over 100 are shown below :—

TABLE 60.

Large stations.		Small stations.	
Mir Ali	683·1	Baroda	287·9
Fort Sandeman	313·9	Thal	263·8
Razmak	368·9	Mhow	203·9
Jubbulpore	177·4	Almora	362·6
Poona	227·3	Ahmedabad	191·5
Dehra Dun	213·3	Lansdowne	170·1
Meerut	246·7	Dharmsala	276·2
Bannu	255·3	Bakloh	472·8
Ambala	143·5	Malakand	112·1
Lahore	147·4	Shillong	274·2
Jhelum	216·5		
Abottabad	167·9		
Landikotal	154·6		
Quetta	120·8		
Kohat	294·2		
Rawalpindi	163·0		

CHART No XIII

MALARIA. INDIAN TROOPS.

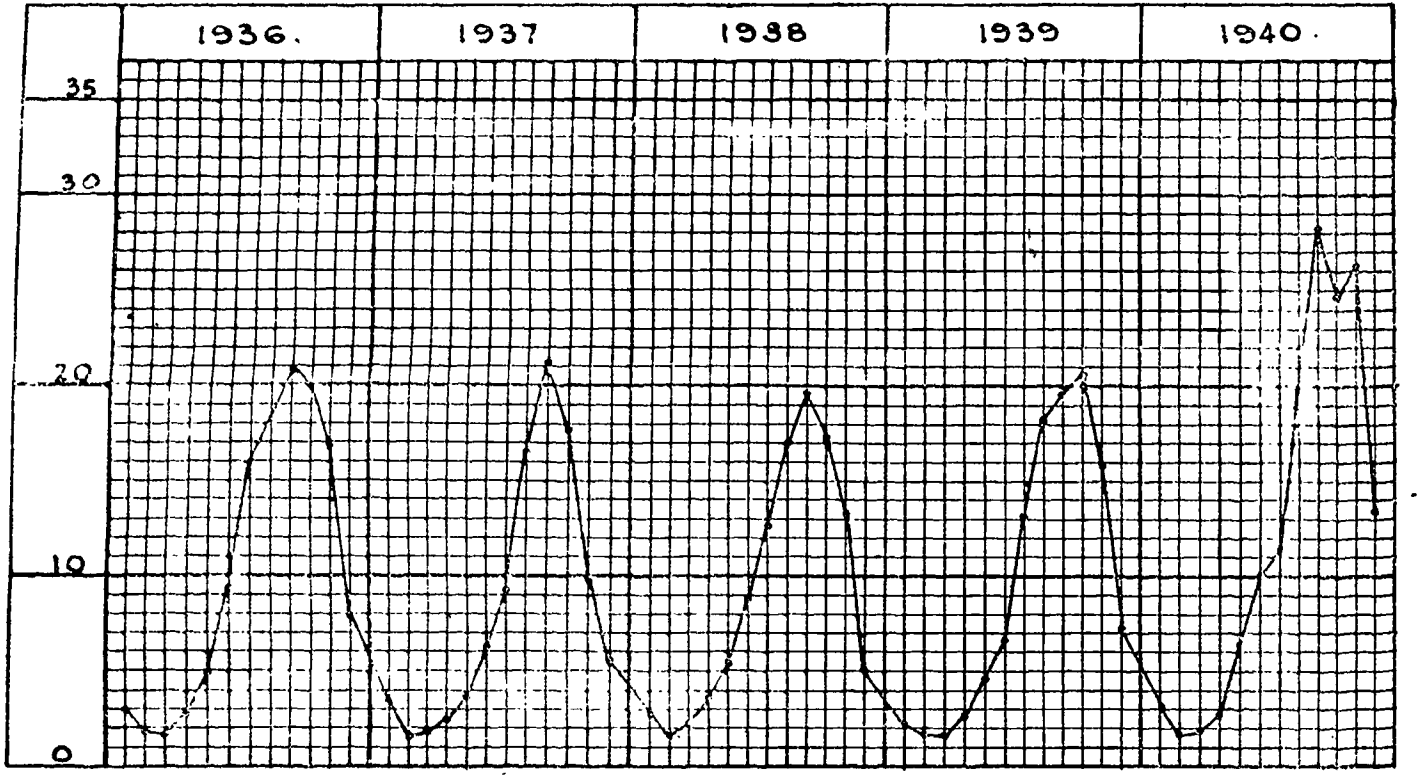
ADMISSION RATIOS PER 1000 OF STRENGTH.

1919	146.5
1920	206.6
1921	223.7
1922	173.9
1923	158.1
1924	129.4
1925	86.7
1926	115.0
1927	98.5
1928	87.8
1929	175.3
1930	153.4
1931	149.4
1932	165.1
1933	212.2
1934	156.5
1935	125.9
1936	123.1
1937	97.9
1938	109.5
1939	118.3
1940	173.2

MALARIA , ALL INDIA. INDIAN TROOPS.

CHART No XIV

MONTHLY ADMISSION RATIOS PER 1,000 OF STRENGTH.



38. Dengue.

For the third consecutive year, the all-India incidence of dengue has remained at 1·1 per 1,000. The following table shows the incidence over the last seven years.

TABLE 61.

Dengue.

1934	2·5 per 1,000.
1935	3·4 „
1936	2·6 „
1937	5·0 „
1938	1·1 „
1939	1·1 „
1940	1·1 „

The stations chiefly affected were in Eastern and Southern Commands.

TABLE 62.

	1939	1940	
Dacca	21·4	180·0	per 1,000.
Madras	..	54·1	„
Alipore	39·6	17·7	„
Bangalore	25·5	1·9	„

39. Sandfly fever.

Compared to 1939, the admissions per 1,000 for sandfly fever have decreased from 6·0 to 5·9 to give a figure well below the average of the past ten years. The all-India annual incidence over the past seven years is shown in table 63.

TABLE 63.

Sandfly fever.

	Ratio per 1,000.
1934	8·3
1935	7·5
1936	10·6
1937	6·0
1938	4·6
1939	6·0
1940	5·9

The incidence in the District principally affected by sandfly fever during 1940 is shown in table 64. The incidence in other Districts has been trivial.

TABLE 64.

Comparative table of sandfly fever in districts.

	Ratio per 1,000.	
	1939.	1940.
Peshawar District	13·1	19·6
Kohat District	12·9	16·9
Lahore District	0·7	5·6
Rawalpindi District	3·6	2·8
Western (I.) District	13·7	1·1
Lucknow District	12·8	0·3
Meerut District	2·3	0·2

TABLE 65.

Sandfly fever in Northern Command.

1930	21·54	
1931	27·45	
1932	27·56	Spraying and fumigation as an anti-malarial measure in certain stations.
1933	16·53	
1934	14·85	
1935	18·83	
1936	18·43	Spraying campaign intensified as an anti-sandfly and anti-mosquito measure.
1937	10·65	
1938	7·10	
1939	7·80	
1940	11·40	

40, Oriental sore.

Compared to 1939, the admissions ratio for this disease has decreased from 1·17 to 0·50. The following table shows the incidence of oriental sore over the last ten years.

TABLE 66.

Oriental sore—admissions over 10 years.

Ratio per 1,000.									
1931.	1932.	1933.	1934.	1935.	1936.	1937.	1938.	1939.	1940.
1·21	0·48	0·45	0·88	0·57	1·48	1·37	0·85	1·17	0·50

41. Fevers of the Typhus group.

The admission rate per 1,000 was ·18 among Indian other ranks compared with 0·6 in 1939. The details have already been considered in paragraph 10.

42. Enteric group of fevers.

The low rate of incidence of the enteric group of fevers, which has been apparent over the last five years, has been maintained in 1940.

TABLE 67.

Case incidence of enteric group fevers.

	Ratio per 1,000.
1934	1·9
1935	1·4
1936	0·7
1937	0·9
1938	0·8
1939	0·5
1940	0·7

It is considered that it is very satisfactory, that, in a year like 1940 when a large proportion of the garrison consisted of individuals whose sanitary conscience was as yet ill developed, the admission ratio per 1,000 for fevers of the enteric group should fall below 1·00 per 1,000. This is all the more satisfactory in view of the improvement in the diagnosis of these fevers which has taken place in recent years (see paragraph 11). The decline which has taken place in the incidence of the enteric fevers in the Indian Army in the last twenty years is almost entirely due to efficient protection with T. A. B. vaccine. The improvement in water supplies, which has played some part in the reduction of these diseases among British troops, has had less effect among Indian troops as the sepoy is less careful regarding the source of his drinking water than is the British soldier. Evidence of the protective value of T. A. B. inoculation is given in table 68.

TABLE 68.

Comparison of incidence in protected and unprotected personnel.

Personnel.	Ratio per 1,000 of respective strength. Cases.	Deaths.
Protected by T. A. B.	0·4	0·04
Unprotected	9·7	0·21

43. Dysentery diarrhoea, Colitis and amœbic hepatitis.

Compared to 1939, the ratio of admission for the dysentery-diarrhœa-colitis group per 1,000 of strength has increased from 23·5 to 33·9. The case mortality during 1940 was 0·08 per cent.

TABLE 69.

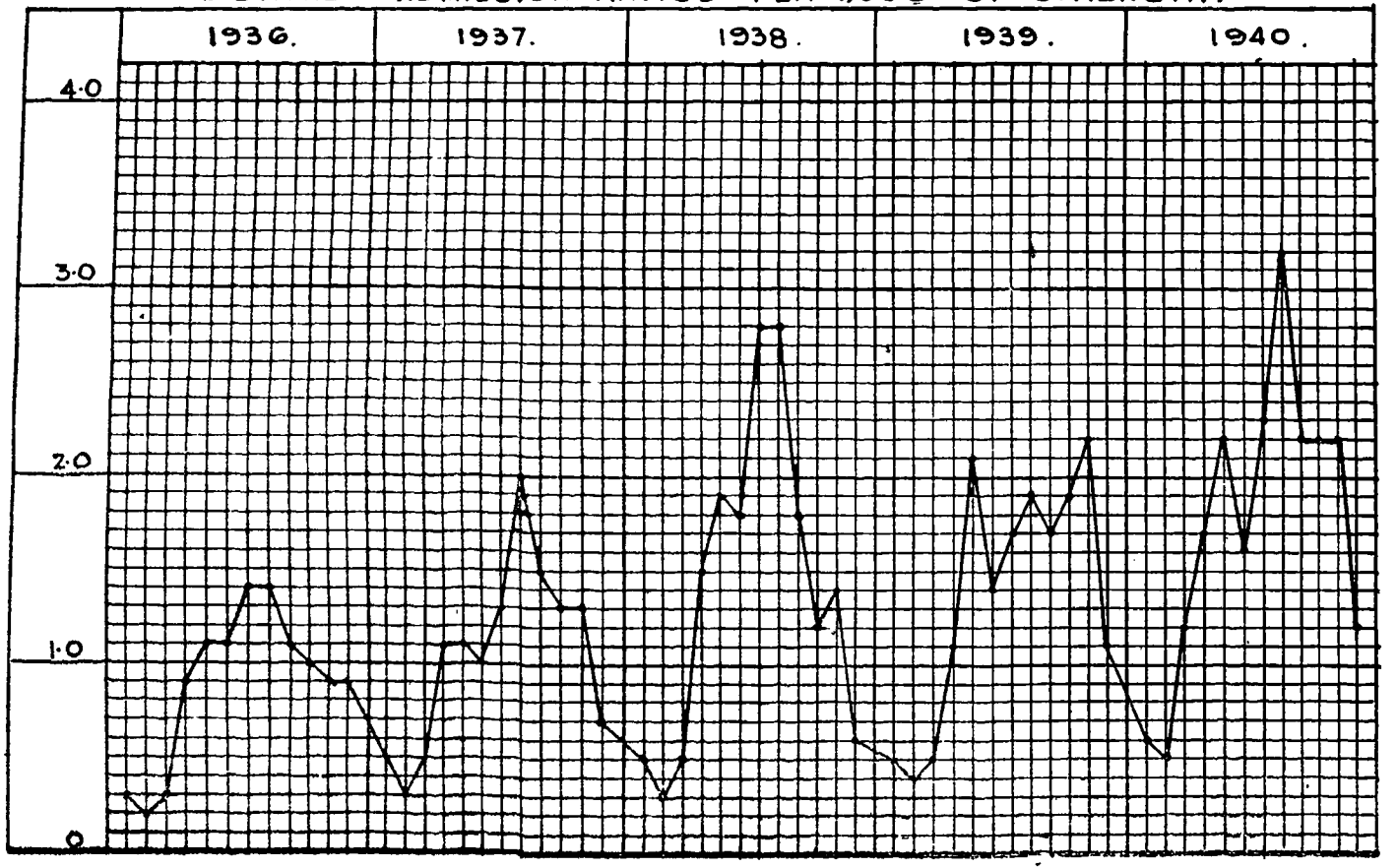
Dysentery, diarrhœa. colitis and hepatitis.

	Ratio per 1,000.				
	Dysentery.	Diarrhœa.	Colitis.	Total	Hepatitis.
1933	15·3	7·9	0·3	23·5	0·6
1934	13·9	6·3	0·2	20·5	0·7
1935	12·2	5·6	0·2	17·9	0·5
1936	11·0	6·2	0·3	17·5	0·6
1937	12·4	5·4	0·4	18·3	0·5
1938	17·2	7·5	0·2	24·9	0·6
1939	17·1	6·3	0·1	23·5	0·5
1940	22·3	10·9	0·7	33·9	0·6

DYSENTERY, ALL INDIA . INDIAN TROOPS.

CHART No XV.

MONTHLY ADMISSION RATIOS PER 1,000 OF STRENGTH.



A study of table 69 makes it clear that there has been no tendency for this group of diseases to show any decline in incidence; indeed, 1940 is the worst year during the eight years under review. Conditions, which have already been discussed in paragraph 34, were, however, unusually favourable in 1940 for the spread of this group of diseases. The explanation of the great difference between the rate (58·7) for British troops and that (33·9) for Indian troops seems to be that many Indian soldiers are already partially immune and not only contract the disease less readily but suffer less severely than does the unseasoned British soldier. A considerable number of Indians merely suffer from diarrhœa for a day or so, and often do not even report sick. Such individuals are dangerous sources of infection.

The percentage of cases for the various types of dysentery are shown below :—

Dysentery protozoal	3·92
„ bacillary proved	61·69
„ bacillary exudate	13·89
„ clinical	20·50

TABLE 70.

Dysentery by Commands—Ratios per 1,000.

Commands.	Amoebic.	Bacillary proved.	Bacillary exudate.	Clinical.	Total.
Northern	0·8	13·1	3·0	4·7	21·6
Western	0·5	7·5	2·7	2·9	13·6
Eastern	1·6	14·2	4·3	4·6	24·7
Southern	0·5	17·6	2·2	4.9	25·2

44. Cholera.

Only one case of cholera occurred during 1940, at Dehra Dun.

45. Cerebro-spinal fever.

Compared to 1939, the admission ratio per 1,000 of strength for this disease has increased from 0·2 to 0·6. This increase is due to small outbreaks which occurred in several stations, principally in training battalions, during the winter months. Overcrowding in all training battalions was prevalent and, owing to the expansion of the Indian Army, unavoidable. There was also overcrowding in certain other stations, and it is noteworthy that it was only when overcrowding was present that outbreaks occurred. None of these outbreaks was at all serious and, owing to treatment by the sulphonilamide group of drugs, mortality was very low. The following table shows the incidence of cerebro-spinal fever over the last six years.

TABLE 71.

Year.	Ratio per 1,000.
1935	0·2
1936	0·1
1937	0·2
1938	0·2
1939	0·2
1940	0·6

46. Diphtheria.

The admissions per 1,000 of strength for diphtheria from 1934 to 1940 have been 0·1, 0·0, 0·1, 0·0, 0·1, 0·0 and 0·0.

47. Influenza.

Compared to 1939, the admission ratio per 1,000 for influenza has increased from 3·7 to 5·1.

TABLE 72.

Year.	Ratio per 1,000.
1934	10·5
1935	5·4
1936	7·3
1937	6·7
1938	4·4
1939	3·7
1940	5·1

48. Small-pox.

Compared to 1939, the admission ratio per 1,000 for small-pox has decreased from 0·2 to 0·1. Considering that this disease is rife in the civil populations surrounding our military cantonments, such a low incidence as 0·1 per 1,000 is a remarkable tribute to the protective value of vaccination. The vaccination state of the Indian Army is high, 99·4 per cent. of Indian other ranks being shown as protected at the half-yearly census taken in October 1940.

49. Tuberculosis.

Compared to 1939, the admission ratio per 1,000 of strength for all tubercular diseases has increased from 2·2 to 2·6. The following table shows the incidence of all tuberculosis over the last twelve years.

TABLE 73.

Total tuberculosis in the Army in India.

Other Ranks.—Ratios.

Year.	British Army.	Indian Army.
1929	1·7	3·8
1930	1·2	3·5
1931	1·0	3·3
1932	1·3	2·4
1933	1·0	2·1
1934	1·1	2·1
1935	1·3	2·4
1936	1·3	2·0
1937	1·4	2·0
1938	1·2	2·1
1939	1·3	2·2
1940	2·3	2·6

Pulmonary tuberculosis.

The following table shows the incidence of pulmonary tuberculosis over the last seven years.

TABLE 74.

Year.	Ratio per 1,000.
1934	1·8
1935	1·9
1936	1·7
1937	1·6
1938	1·6
1939	1·9
1940	2·2

50. Venereal diseases.

Compared to 1939, the admisssion ratio per 1,000 of strength for all venereal diseases has risen from 8·5 to 18·9, an increase common to all Commands. The causes for this very large increase are not very obvious, but it seems possible that the following factors may all have played their parts :—

(a) *An increase in medical examinations.*—It is generally agreed that the Indian soldier is prone to conceal his venereal disease, and not infrequently avoids official treatment entirely. In 1940 there was a plethora of medical examinations : for troops about to proceed overseas, for categorisation, for new arrivals in the station, etc. At these inspections many cases of venereal disease were discovered which in normal times might well have escaped detection.

(b) *More recruits from the towns.*—Owing to the great increase in recruits for mechanical transport and ordnance units, the tendency has been for the proportion of recruits drawn from towns and industrial areas to increase. These recruits are more sophisticated than the country recruits and also more accustomed to consorting with prostitutes.

(c) *War psychology.*—As discussed in paragraph 20, there is a tendency in war-time for young soldiers to adopt the mental attitude " let me enjoy myself before I go on active service where I may possibly be killed ". This frequently leads to an increase in sexual indulgence.

CHART NO. XVI.

VENEREAL DISEASES
INDIAN TROOPS

ADMISSION RATIOS PER 1,000 OF STRENGTH.

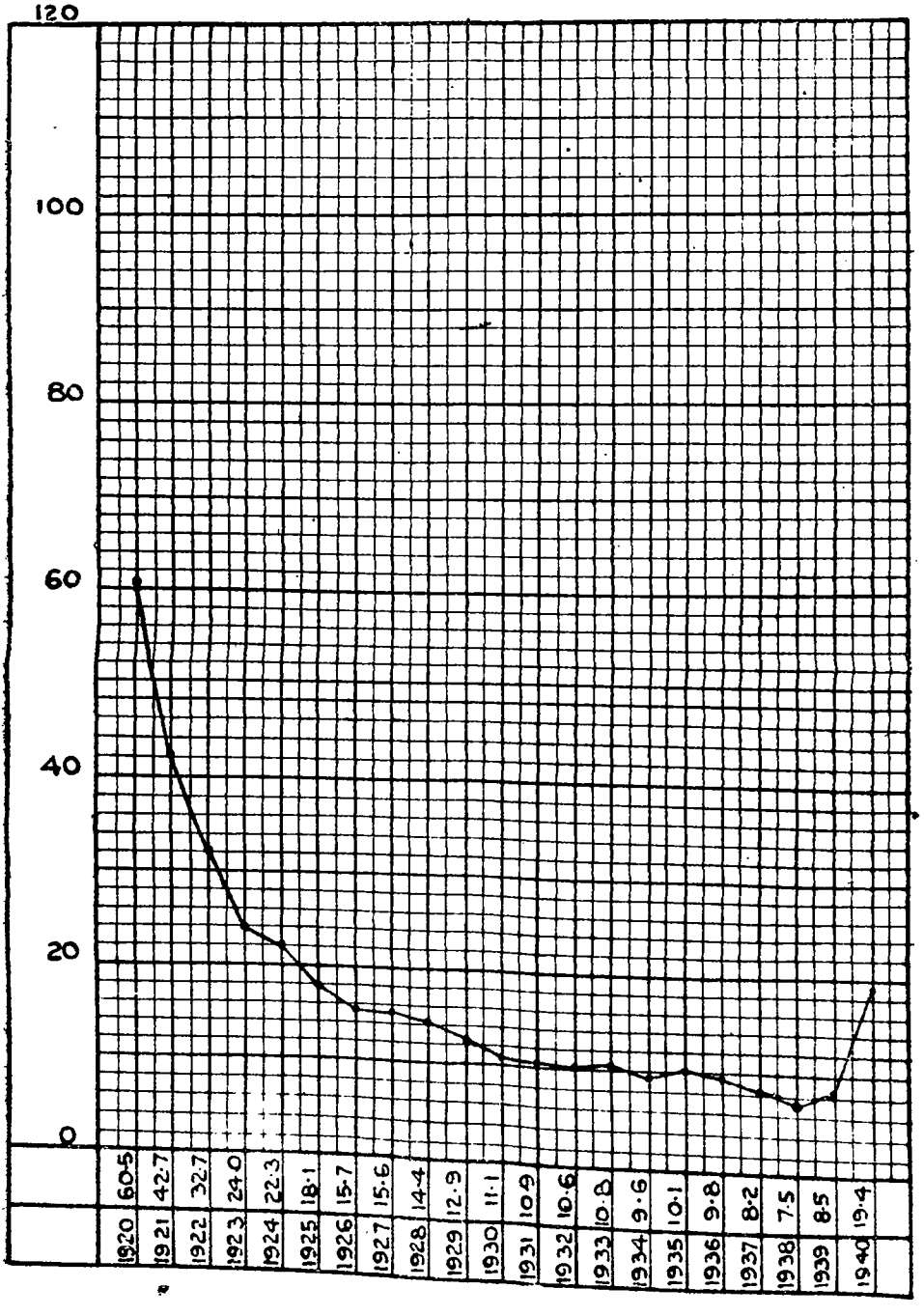


CHART No. XVII.

VENEREAL DISEASES, ALL INDIA. INDIAN TROOPS.

MONTHLY ADMISSION RATIOS PER 1,000 OF STRENGTH.

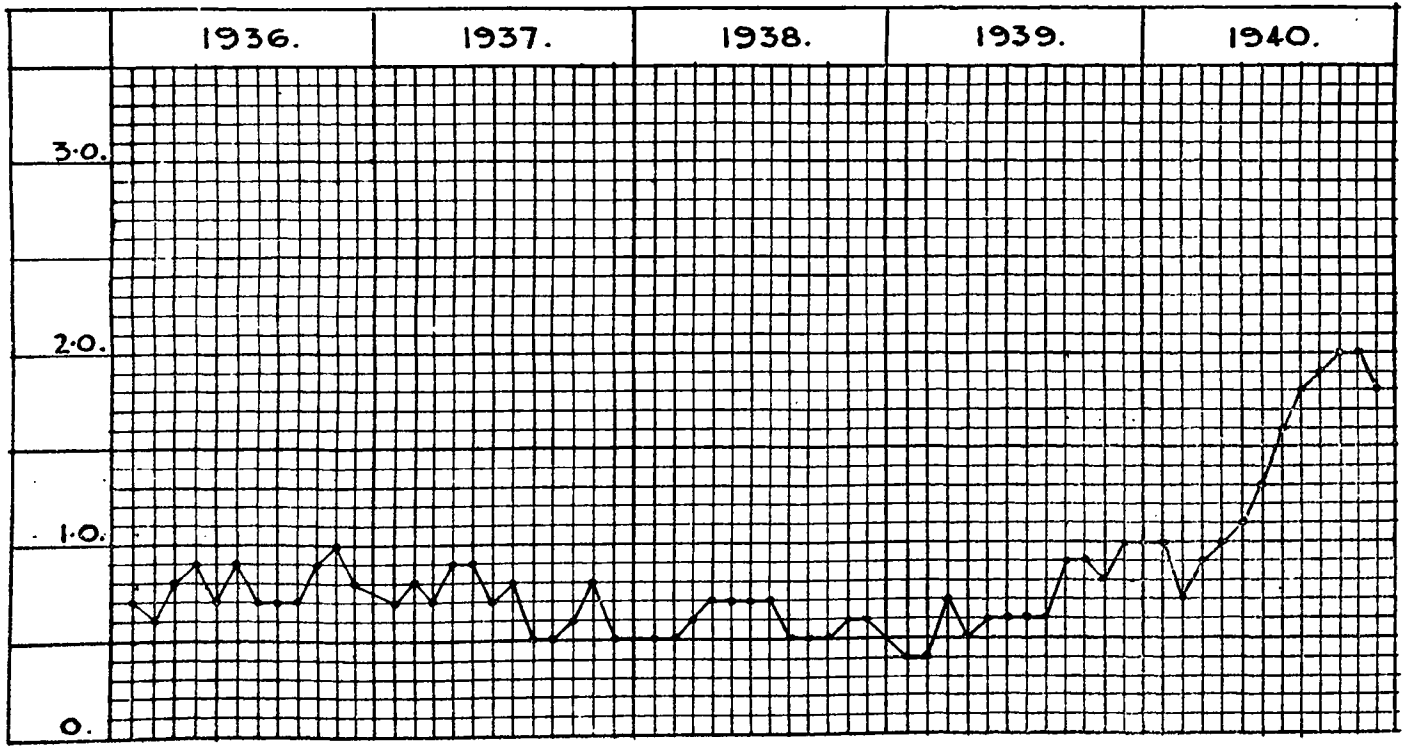


TABLE 75.

Annual comparison of total venereal diseases.

Ratio per 1,000.

1930.	1931.	1932.	1933.	1934.	1935.	1936.	1937.	1938.	1939.	1940.
11·1	10·9	10·3	10·8	9·6	10·1	9·8	8·2	7·5	8·5	18·9

The following table shows the incidence of gonorrhœa, syphilis and soft chancre over the past five years (ratio per 1,000).

TABLE 76.

Disease.	1936.	1937.	1938.	1939.	1940.
Gonorrhœa	4·8	3·4	2·9	3·4	7·5
Syphilis	3·4	3·0	3·1	3·4	6·1
Soft chancre	1·6	1·7	1·5	1·2	1·4
Total venereal	9·8	8·2	7·5	8·5	18·9

51. Diseases of the digestive system.

Compared to 1939, the admission ratio per 1,000 has increased from 56·6 to 61·7. Admissions for the more important members of this group of diseases over the last four years are given in the table below.

TABLE 77.

Diseases of the digestive system.

Ratio per 1,000.

Year.	Tonsillitis.	Pharyngitis.	Gastritis.	Dyspepsia.	Jaundice.
1937	5·8	16·1	1·0	4·1	1·9
1938	6·1	19·3	1·1	5·2	2·1
1939	5·5	24·1	1·2	4·5	2·8
1940	5·0	17·5	1·2	6·9	4·3

52. Diseases of the respiratory system.

The diseases moving up this group have an admission ratio of 21·8 per 1,000 in 1940 compared to 24·0 in 1939. The following table shows the incidence of certain members of the group over the last seven years.

TABLE 78.

Respiratory diseases by types.

Ratio per 1,000.

Year.	Diseases of bronchi and bronchioles.	Diseases of larynx and trachea.	Pneumonia, lobar and lobular.
1934	15·0	1·0	6·0
1935	11·9	1·0	4·9
1936	11·9	0·9	5·4
1937	13·3	0·9	5·2
1938	12·7	0·7	5·0
1939	14·0	0·9	2·9
1940	16·5	0·8	7·9

The following table shows admissions and deaths per 1,000 of strength and percentage mortality over the last six years for pneumonia.

TABLE 79.

Annual comparison of penumonia.

Ratio per 1,000.

	1935.	1936.	1937.	1938.	1939.	1940.
Admissions . . .	4·9	5·4	5·2	5·0	5·4	8·3
Deaths	0·51	0·61	0·34	0·43	0·29	0·29
Percentage case mortality .	10·52	11·38	6·61	8·56	5·39	3·49

53. The minor septic and local injuries group of diseases.

The following table shows the admission ratios per 1,000 for the more important members of this group over the last five years.

TABLE 80.

Annual comparison of minor septic and local injury group.

Ratio per 1,000.

Year.	Minor septic diseases.	Local injuries.	Cellulitis.	Boils.
1936	33·4	52·6	24·5	6·0
1937	31·4	51·8	23·5	5·4
1938	34·1	59·8	25·5	5·9
1939	36·8	57·0	26·1	7·5
1940	36·1	45·8	28·0	5·2

54. Effects of heat.

Compared to 1939, there has been the very slight increase of 0·1 per 1,000 in the admisson ratio for effects of heat. The admission ratios for this condition over the last seven years are shown in the table below. It is of interest to compare these ratios with those for British troops shown in table 43.

TABLE 81.

Admission for effects of heat.

Ratio per 1,000.

1934.	1935.	1936.	1937.	1938.	1939.	1940.
0·2	0·1	0·1	0·3	0·2	0·2	0·2

The great majority of cases occurred in the Northern Command, only 3 being reported from other Commands.

55. Mental disease.

The following table shows the incidence of mental diseases over the last seven years.

TABLE 82.

Admissions for mental diseases.

Ratio per 1,000.

1934.	1935.	1936.	1937.	1938.	1939.	1940.
1·0	0·8	0·9	1·7	0·9	1·3	1·9

56. Scabies.

The tendency to increase in incidence which this condition has shown during the last three years has been even more marked in 1940. This is attributed to the large influx of recruits during 1940, the disease almost always being imported into the army by soldiers from their villages. The following table shows the incidence of scabies over the past six years (ratio per 1,000).

TABLE 83.

Scabies admissions during past 6 years.

Ratio per 1,000.

1935	9·6
1936	7·7
1937	7·7
1938	11·2
1939	11·9
1940	16·8

57. Other diseases.

Mumps.—The admissions to hospital ratio for mumps was 9·3 per 1,000. The very great majority occurred in Gurkha units in Northern Command.

Kala azar.—The incidence of kala azar over the last six years is shown in the following table :—

TABLE 84.

1935.	1936.	1937.	1938.	1939.	1940.	
0·16	0·29	0·14	0·29	0·48	0·27	ratios per 1,000.

Taeniasis.—Compared to 1939, there has been an increase from 0·45 to 0·56 in the admission to hospital ratio per 1,000 for taeniasis. Of this 0·36 per 1,000 were cases of infestation by T. saginata and 0·05 per 1,000 by T. solium.

Cysticercosis.—There were no admissions for this condition during the year.

Ankylostomiasis.—Routine anthelminthic treatment of all recruits on joining their training battalions was introduced during 1940. The number of recruits found infested with ankylostomes varied from 100 per cent. in one Gurkha training company to 25 per cent. in a Sikh training battalion. The results of treatment have been most satisfactory as has been evidenced by a marked improvement following treatment in the general health and vigour of those infested.

58. Invaliding.

The invaliding ratio, at 11·86 per 1,000, is 5·43 greater than in 1939. The invaliding ratios which have persisted over the past six years are shown in the table below.

TABLE 85.

Invaliding.

Ratios per 1,000.

1935	5·54
1936	5·52
1937	5·49
1938	5·83
1939	6·43
1940	11·86

The principal diseases for which invaliding was necessary in 1940 are given in table 86.

TABLE 86.

Principal causes of invaliding for Indian troops.

Diseases.	Ratios per 1,000.	Increase or decrease as compared with 1939.	
		Increase.	Decrease.
Pulmonary tuberculosis	2·02	0·32	..
Injuries	1·58	0·50	..
Diseases of the bones, joints muscles, fasciae and bursae	1·04	0·51	..
Mental diseases	0·81	0·33	..
Diseases of the nervous system	0·96	0·58	..
Diseases of eye	0·97	0·61	..
Diseases of the respiratory system	0·81	0·47	..
Diseases of the digestive system	0·67	0·40	..
Other tubercular diseases	0·28	0·07	..
Diseases of the circulatory system	0·56	0·40	..
Diseases of teeth and gums	0·33	0·22	..
Diseases of ear and nose	0·35	0·26	..
Diseases of urinary organs	0·18	0·11	..
Diseases of blood	0·21	0·14	..
Venereal diseases	0·12	0·08	..

The invaliding ratios by Commands during 1940 are shown in the following table :—

TABLE 87.

(Ratios per 1000).

Northern Command	12·94
Eastern Command	11·65
Southern Command	12·33
Western (I.) District	5·74

59. Deaths.

Compared to 1939, the ratio of deaths per 1,000 of strength shows a decrease from 2·12 to 2·11, thus maintaining the steady decline shown over the past fifteen years. The following table shows death ratios for the last six years—

TABLE 88.

Deaths.

Ratios per 1,000.

1935	2·15
1936	2·16
1937	1·77
1938	2·21
1939	2·12
1940	2·11

The following table shows the death ratios in individual Commands :—

TABLE 89.

Northern Command	2·29
Eastern Command	2·01
Southern Command	1·99
Western (I.) District	1·67

The following table shows the causes of death, ratios per 1,000 of strength, for 1940 :—

TABLE 90.

Causes of death for Indian troops.

Diseases.	Ratios per 1000.
Local injuries	0·76
Pneumonia, lobar & lobular	0·29
General injuries	0·10
Circulatory diseases	0·09
Digestive diseases	0·13
Nervous diseases	0·03
Pulmonary tuberculosis	0·11
Enteric group of fevers	0·05
Meningococcal infection	0·10
Tuberculosis (other than pulmonary)	0·01
Dysentery	0·02
Malaria	0·09
Urinary diseases	0·02

60. Recruiting.

The percentage of recruits accepted at recruiting centres in the year ending 31st March 1940 was 75·5 compared with 54·6 of the previous year. The following table shows the principal causes of rejection of recruits during 1940.

Recruiting.

A percentage of 24·5 were rejected during the year ending 31st March 1941.

The principal causes of rejection of recruits for the year were as follows :—

TABLE 91.

Disability.	Percentage rejected at recruiting centres.	Percentage rejected during training at depots.
1	2	3
Malaria	2·7	0·01
Tuberculosis (pulmonary)	0·04	0·02
Tuberculosis (other organs)	0·03	0·01
Venereal diseases	1·3	0·01
Other diseases due to infection	0·2	0·003
Diseases of the nervous system	0·06	0·09
Defective vision	2·5	0·02
Trachoma	2·1	0·004
Other eye affections	0·5	0·02
Otitis media	2·09	0·01
Defective hearing	0·06	0·01
Other ear diseases	0·1	0·002
Diseases of nose and throat	0·2	0·001
Valvular disease of the heart	0·9	0·002
Disordered action of the heart	1·9	0·003
Varicose veins	0·4	..
Haemorrhoids	0·3	0·002
Varicocele	0·6	..
Other diseases of circulatory system	0·03	0·004
Anaemia	0·3	0·001
Goitre	0·3	0·003
Respiratory diseases excluding tuberculosis	0·4	0·01
Pyorrhoea	0·4	0·003
Loss or decay of teeth	0·1	..
Hernia	0·6	0·01
Other diseases of digestive system	0·07	0·01
Ankylosis of joints	0·06	0·003
Flat feet	0·1	0·01
Knock knee	0·2	0·01
Curvature of spine	0·2	..
Other deformities	1·0	0·003
Skin diseases	0·8	0·01
Poor physique	0·3	0·02
Other causes	2·1	0·3
Synovitis	0·0	..
Bronchitis	0·04	0·001
Total	24·5	·59

N. *B.*—The figures in columns 2 and 3, and in the heading, are in respect of the following only :—

Indian Armoured Corps.
Artillery.
Sappers and Miners.
Indian Signals.
Infantry.
Garrison Coys.
I. T. F.
Labour Corps.

The numbers rejected for trachoma at the main recruiting centres during 1940 were as follows as compared to the two previous years.

TABLE 91 (*a*).

Quarter ending	1938.					1939.					1940.				
	Mar.	June.	Sept.	Dec.	Total.	Mar.	June.	Sept.	Dec.	Total.	Mar.	June.	Sept.	Dec.	Total.
Peshawar	4	7	8	14	33	3	3	7	76	89	20	29	152	42	243
Rawalpindi	8	20	27	16	71	22	36	28	148	234	123	106	235	180	644
Lahore .	32	21	..	5	58	7	7	17	196	227	229	274	537	325	1,365
Jullundur	90	77	71	40	278	77	78	115	244	514	288	282	460	192	1,222
Delhi .	149	199	176	128	652	117	165	80	144	506	249	315	392	186	1,142
Lucknow.	8	4	6	2	20	7	10	29	17	63	46	106	201	271	624
Ajmer .	..	1	..	..	1	..	1	..	..	1	4	33	57	41	135
Poona .	1	2	..	2	5	..	..	1	2	3	..	..	6	8	14

61. Military colleges and schools.

The Royal Indian Military College, Dehra Dun.—The health of the cadets has been very good throughout 1940, There was no serious outbreak of illness; and the diet and accommodation has been satisfactory.

The K. G. R. I. M. Schools at Jullundur, Jhelum and Ajmer.—The general health of the pupils at these schools has been excellent. There have been no serious outbreaks of infectious disease and the physical development of the boys has been satisfactory. The welfare of the boys regarding games, physical training, and bathing facilities is carefully supervised at all schools. The average gain in weight has been a fraction over 2 lbs. per boy per mensem.

The Nepalese Contingents.

62. Special diseases and remarks.

General health.—With the exception of the severe epidemic of malaria which occurred at Dargai, the health of both Nepalese contingents compared not unfavourably with that of other ranks of the Indian army of the same length of service. The admission to hospital ratio per 1,000 of strength was 757·8, and the average constantly sick ratio was 19·07.

As certain misgivings had been felt regarding the general stamina and fitness for active service of these contingents, a stringent physical test was carried out on five units at the end of 1940. The units in question carried out the following over a period of seven days:—

(*a*) Marched 15 miles a day for four days.

(*b*) Every N. C. O. and man dug continuously for four hours a day on two separate days.

(*c*) Carried out a twenty-four hours tactical exercise on hard scale including moving deployed across country for a minimum distance of ten miles.

At the end of each day, all individuals taking part in the exercise were reviewed by specially selected medical officers ; and at the termination of the week's test a report was prepared by the Assistant Director of Medical Services of the District concerned regarding the physical condition of the men who had undergone the test. The results of the test were thoroughly satisfactory and showed that 99 per cent. of those taking part were fit for general service.

Filariasis.—It was found that about 80 per cent. of the Nepalese troops suffered to a greater or lesser degree from filariasis. The condition, however, appeared to affect their general health very little ; and on arrival in India less than 10 per cent. were found to be unfit for full general service on this account.

Cholera.—A small but sharp outbreak of 16 cases with 3 deaths of cholera occurred at Hassan Abdal at the end of November and beginning of December 1940. This outbreak was considered to have been water-borne and due to lack of sanitary discipline on the part of the victims in drinking polluted and forbidden water.

Malaria.—A serious epidemic of malaria occurred in August and September at Dargai Camp, which resulted in over 900 admissions to hospital. It was realised from a survey of the camp site at Dargai in July 1940 shortly before the camp was occupied that it would be malarious, but it was not expected that such a serious outbreak would result. Nor, it is considered, would it have attained such dimensions but for poor net-discipline. The Nepalese were then still untutored in matters of hygiene (great improvement took place later) and it may be said that scarcely a man used his net properly at night. Dargai camp was surrounded by irrigated land where extensive breeding of mosquitoes takes place. In close proximity to the camp were three villages with spleen rates of 43 per cent., 30 per cent. and 21 per cent. respectively.

Non-combatants (enrolled).

63. Special diseases and remarks.

Admission ratios per 1,000 for enrolled non-combatants, at 426·2, show an increase of 103·00 over 1939. The death ratio has been 2·50 compared with 2·50 per 1,000 in 1939. The invaliding ratio per 1,000 was 6·05 compared to 4·23 in 1939.

These increases are due to the influx of person suffering from sub-clinical malaria, to increase in venereal disease and to the acceptance of recruits with lower physical standard than is demanded in time of peace. Pressure for particular classes of followers or for special trades has not infrequently led to the acceptance of indifferent material.

The principal diseases of enrolled non-combatants during the last twelve years is shown in table 92.

TABLE 92.

Admission for non-combatants (enrolled).

Ratios per 1,000.

Year.	Total admissions.	Malaria.	Sandfly fever.	Venereal diseases.	Pneumonia.	Dysentery-diarrhœa group.	Tuberculosis pulmonary.
1929 . .	302·6	128·1	11·5	12·4	12·7	12·3	2·4
1930 . .	250·6	86·3	6·4	11·3	11·9	14·5	2·6
1931 . .	285·8	94·2	9·4	10·9	12·2	12·9	2·3
1932 . .	266·4	90·7	7·4	10·3	9·9	11·3	2·2
1933 . .	332·9	143·1	6·2	11·1	8·7	13·0	1·6
1934 . .	287·6	102·5	4·4	10·5	10·3	12·6	1·9
1935 . .	302·9	106·6	4·2	10·3	7·5	11·6	1·6
1936 . .	279·1	84·1	8·6	9·8	7·8	9·2	1·7
1937 . .	279·0	77·1	7·8	10·6	7·8	10·9	1·6
1938 . .	272·0	74·9	4·3	9·6	7·2	12·5	1·8
1939 . .	323·2	98·4	5·1	10·2	8·1	9·1	1·7
1940 . .	426·2	139·4	3·0	35·5	9·5	23·8	1·6

The following table shows the average number constantly sick per 1,000 for enrolled non-combatants during the past six years :—

TABLE 93.

Year.	Ratios per 1,000.
1935	10·73
1936	9·76
1937	9·84
1938	10·11
1939	11·45
1940	13·28

The following table shows the principal causes of death during 1940 :—

TABLE 94.

Principal causes of death.	Ratios per 1,000.
Pneumonia	0·45
Injuries	0·38
Circulatory diseases	0·32
Infectious diseases	0·29
Pulmonary tuberculosis	0·29
Digestive diseases	0·32

Venereal diseases.—One of the most remarkable features of the health of followers for 1940 has been the very great increase in venereal disease ; 18·40 per 1,000 in 1940 compared to 5·31 in 1939. It is thought that this increase is relative and not actual, and is mainly due to the greatly increased frequency and strictness of the medical examinations which this class has undergone since the outbreak of war. Before the war, it was rare that a follower was examined by a medical officer ; and there is no question but that prior to 1940 a large number of venereal cases passed undetected which are now detected.

PART I.

SECTION III

SPECIAL SUBJECTS.

SECTION III.

SPECIAL SUBJECTS.

64. Hygiene.

A. Accommodation.

During 1940 troops have been accommodated in permanent barracks, in huts and in tents. Considering the conditions consequent upon the expansion of the Army in India, this accommodation has on the whole been satisfactory. A good deal of unavoidable overcrowding took place in certain stations, particularly in stations where training battalions were situated. This appeared to have no adverse effect on health during the spring and summer; but during the late autumn and the winter undoubtedly predisposed to the unusual prevalence of cerebro-spinal fever which was noticeable in several stations.

B. Anti-malaria measures.

Anti-malaria work during 1940 has been carried out in all stations with zeal; and it is considered that credit is due to anti-malaria medical officers and assistant surgeons for their efforts during the year. At the same time it is thought that anti-malaria work in general failed to reach the high standards of 1938 and 1939. The reasons for this are thought to be due to :—

(*a*) inexperience on the part of anti-malaria officers, following on the despatch of many regular officers overseas.

(*b*) frequent changes of anti-malaria officers.

(*c*) frequent moves of units.

(*d*) lack of knowledge on the part of unit personnel of the importance of methods of personal protection.

All this resulted from the war, and was unavoidable.

The anti-malaria methods employed in India throughout 1940 were the same as those used during the past few years. These have already been fully discussed in the Reports for 1938 and 1939, and it is only intended to remark in the following paragraphs on those few points of difference or interest which arose during 1940.

Malariol.

This was used instead of " Army oil mixture " and gave very good results. Instead, however, of malariol being available on an " as required " scale, the Army in India was limited to 14,480 gallons for the year. This proved to be insufficient, but was eked out by waste oil from garages, power stations, etc.

It is preferable from the point of view of efficiency for malariol to be supplied on an " as required " scale, although this undoubtedly leads to some waste. It is expected that malariol will be available on an " as required " scale during 1941.

Spraying.

Once again, it was found that spraying with one or other of the following solutions was a most valuable anti-mosquito measure :—

(*a*) Liquid extract of pyrethrum (Medical Stores Department) . .	1 part.
Third quality Kerosine	19 parts.
(*b*) Lethane	1 part.
Third quality kerosine	32 parts.

The pyrethrum solution costs Rs. 1-11-0 per gallon (exclusive of the cost of the kerosine, which is a free issue) made up ready for spraying; and the lethane solution (exclusive of the cost of the kerosine), ready for spraying, Rs. 1-4-0 per gallon. There seems to be nothing to choose in efficiency, but the pyrethrum solution is pleasant to use as it does not irritate the eyes, nasal or tracheal mucus membranes as lethane does with many people. In addition, pyrethrum is an Empire-grown product.

Extensive use was made during the year of the spray gun recommended by the Malaria Institute of India (the sprayer M. I. S. H.). There is no doubt that in the hands of well trained anti-malaria personnel this spray gun is most efficient and very economical of spray solution. In the hands, however, of the sepoy or coolie it appeared to be less useful than the ordinary flit gun which can be bought in any bazaar for a rupee.

There is still a great tendency on the part of anti-malaria officers to begin spraying in barracks on the appearance of the spring plague of culicine mosquitoes. This, of course, is merely wasting anti-malaria funds. The trouble is that spraying is now well recognised among all ranks of the Army in India as a most efficient insecticide; and pressure is often brought to bear on anti-malaria officers by officers commanding units to kill off all mosquitoes, irrespective of species, which may be making their men uncomfortable at night. To achieve the best results with the limited funds at our disposal spraying should be concentrated on the anopheline season, and not dispersed over the whole mosquito season. Owing to the large number of men accommodated under canvas in 1940, extensive spraying of the inside of tents was done during the year. This procedure proved to be much less efficient than spraying in barrack-rooms, possibly because :—(*a*) mosquitoes do not remain in such numbers in tents after feeding as they do in barrack-rooms and (*b*) of the dispersal of the men in tents, spraying was not so efficiently carried out.

Considerable attention was given to spraying in the married quarters of Indian soldiers, in bazaars adjoining military barracks, and in similar places. It is considered that spraying such places is of much more importance in preventing malaria among troops than spraying barracks, since it is in the former that the reservoir of malarial infection lies and the infected mosquito lurks.

Nets.

There is no question but that this method of protection against malaria remains our sheet-anchor in the case of troops located in malarious areas outside cantonments. It is also, of course, of great value inside cantonments.

During 1940 much less value was obtained from nets than there ought to have been. This was due to three reasons :—

(*a*) *Shortage of nets.*—At one time in one Command about one-quarter of troops in training battalions and similar units were without nets. Everything possible was done by all concerned, but nets simply were not available.

(*b*) *Unintelligent use of nets.*—Instances in the early part of the malaria season were constantly coming to light where barrack-rooms were wired for nets but where the troops slept outside without proper means of slinging their nets. This was subsequently rectified.

(*c*) *Lack of discipline among new troops.*—The Indian recruit, the Territorial and the Neapalese dislike sleeping under a net; and there is no doubt that it is a common practice for these soldiers to sleep at night with one half of their net drawn back from their bodies. One reason for the epidemic of malaria which occurred at Dargai was due to this habit.

Antimosquito cream.—Although this is an excellent insectifuge, it is unpopular with the troops. The reasons for this are :—(*a*) it soils the necks of shirts and also coat-collars and cuffs, and (*b*) it is unpleasant to use when the skin is sweating freely.

Modern methods of treatment.—The efficiency of the treatment of malaria has been enhanced by the use during the last few years of atebrin and plasmoquine. This has had two important effects in reducing the incidence of malaria :—

(*a*) Relapses are less frequent than with the old method of treatment by quinine alone.

(*b*) The patients' blood is sterilized more rapidly and surely, thus diminishing the military reservoir of infection.

The effects of modern treatment in reducing the incidence of relapse malaria are well illustrated in the table below, which shows the incidence of malaria per 1,000 of British troops in Northern Command for the last fifteen years. It will be seen that the admissions for relapse malaria began to fall in 1932 and that this fall accelerated from then to 1939, coincident with the ever increasing use of atebrin and plasmoquine and with the standardisation of their therapeutic employment. And not only have the actual numbers of relapse cases per 1,000 of strength declined, but the ratio of relapse to fresh cases has shown an even greater and more striking fall. This ratio in 1926 was about 2 relapse to 1 fresh, in 1932 about 1 to 1, in 1937 about 1 relapse to 2 fresh and in 1940 about 1 relapse to 3 fresh. It is true that in 1940 the actual numbers of relapse cases per 1,000 of strength were higher than in any year since 1936; but this is due to the fact that, since there was a great increase in fresh cases in 1939 and 1940, there was naturally a greater stock of malarious persons in 1940 from which the relapses were supplied. In view of this, it is all the more striking a commentary on the efficiency of treatment that the relapse-fresh ratio should in 1940 be the lowest ever recorded in this Command.

TABLE 95.

Year.	Fresh.	Relapse.	Total.	Ratio relapse to fresh.
1926	90·62	177·98	268·60	2 to 1
1927	67·07	140·93	208·00	
1928	36·76	75·43	112·19	
1929	124·32	69·14	193·46	
1930	83·04	122·75	205·76	
1931	61·94	76·44	138.40	
1932	41·02	50·13	91·15	1 to 1
1933	118·43	39·72	158·15	
1934	38·64	36·68	75·32	
1935	43·40	13·73	57·13	
1936	45·17	33·01	78·18	
1937	29·42	15·73	45·15	1 to 2
1938	33·31	22·76	56·07	
1939	51·94	15·69	67·63	
1940	89·65	33·61	120·26	1 to 3

Atebrin prophylaxis.—The "follow-up" of the controlled experiment in malaria prophylaxis by means of atebrin (described in this Report for 1939), which was undertaken in Waziristan on 1200 Indian troops during the malaria season of 1939, was completed on 31st March 1940. The conclusions were that 0·1 gramme of atebrin taken orally on three consecutive days each week throughout the whole of the malaria season :—

(*a*) Is a useful, though not an absolute, delaying agent against malaria, *during the period of its administration.*

(*b*) Allows malaria to reappear after its administration has ceased (*i. e.* it masks malaria during the period of its administration).

(*c*) Is possibly too small a dose. Probably 0·4 gramme weekly administered either as 0·1 gramme daily or for consecutive days, or as 0·2 gramme on two consecutive days would have been better.

(*d*) Caused no ill effects whatever in the sepoys, although all were performing had physical work throughout the trial. Judging by the absolute immunity from ill effects, it seems probably that 0·5 gramme or even 0·6 gramme per week would produce no toxic symptoms in fit men at full military duty.

C. Co-operation with Civil Authorities.

Some progress has been achieved, mainly in Northern Command, during 1940 ; but a great deal yet remains to be done. In Northern Command fully

organised committees now exist in fifteen stations, and in three others, although committees have not been formed, liaison has been established between the military and civil authorities. These committees meet from three to four times a year in each station, and discuss various problems of joint interest to the military and civilian populations. So far, relatively few concrete results are apparent on the civil side ; but it is felt that the mere discussion of matters of hygiene and sanitation, even if little is actually done, cannot fail to have a beneficial educational effect on the members of these committees. It is idle to expect to hurry matters ; and it is thought to be a matter for congratulation that it has been possible to have erected the frame-work of co-operation by the formation of fifteen committees in Northern Command.

D. Dairies.

Government military dairies, and the milk supplied by them, can be considered as having been very satisfactory during 1940. Certain alterations, both inside and outside dairy buildings, are still, however, necessary before perfection is attained ; but the standard of hygiene is, on the whole, improving each year. In all dairies a willingness to carry out hygienic recommendations, where possible, has been noticeable during 1940. The health of women and children in India owes a great deal to the high standard of milk supplied by these dairies.

During 1940, milk and butter from all government military dairies in Northern Command was examined chemically and bacteriologically at irregular intervals, but not less than twice a month. The estimation of fat was done by the Gerber method by the officer in medical charge of the dairy at his periodic inspections. Other tests (*i.e.* solids non-fat, reductase test, butter fat and moisture in butter) were carried out in District or Brigade Laboratories where such existed in the station. In stations where there was no laboratory, the reductase test was done in the clinical side-room ; but samples of milk for solids non-fat and of butter for examination for butter fat and moisture were forwarded to the nearest laboratory. The results of these tests were generally most satisfactory throughout the year.

The condition of many private dairies from which Indian troops and the families of British officers and other ranks often obtain their dairy supplies is, however, far from good. Although the price of milk from these dairies is only a little less than that from the Government military dairy, many persons who ought to know better still patronise the small private dairy. Many private hotels and boarding-houses are also offenders in this respect. Some private dairies sell milk in bottles with the words " Government Military Dairy "

embossed on the glass. One flagrant instance of this came to light in 1940 and was duly reported to the proper authority in the hope that a prosecution would result. The great hygienic importance of this fraudulent practice is that since military dairy milk is well known to be pasteurised, the purchaser of unpasteurised milk delivered in a bottle marked " Government Military Dairy " will probably, thinking it to be pasteurised, use the milk without boiling it.

E. Field Hygiene and Sanitation.

Considerable attention was devoted during the year to the training of officers and men in field hygiene and sanitation. In Northern Command courses of instruction were held in all stations in accordance with R. A. I. Instruction No. 342. Special training was given to those regimental other ranks who were earmarked to join Field Hygiene Sections on mobilization. This latter system has, however, been lately superseded by the allotment of R.A.M.C. and I. H. C. other ranks to Field Hygiene Sections. A pamphlet dealing with sanitation in operations on the North West Frontier was published in Northern Command, and issued to every medical officer and assistant surgeon and to all units and formations in the Command.

Opinions differ regarding the value of lectures on hygiene to combatant officers, and one medical officer has expressed his views as follows :—

> " My own personal opinion on the giving of these lectures is that it is a waste of time. All that they will be told, they can find in a book ; and they only attend a lecture because it is an order, but their attention is not with the lecturer, no matter how interesting he makes it."

It is, however, relatively rare that a combatant officer reads a book on hygiene or sanitation ; and it is considered that, since attendance at lectures is compulsory whereas reading a book is not, it is mainly by lectures that sanitary knowledge can be imparted to the average combatant officer. These lectures, therefore, are considered to be of great value. The actual degree of their value naturally depends on the skill of the lecturer ; and in this there is unfortunately great variation. It is certainly difficult to lecture about sanitation in an interesting way ; but it is considered that there are sufficient medical officers with the requisite knowledge and energy to make these lectures so reasonably real that a proportion of their audience absorbs at least *some* sanitary knowledge. This fact alone justifies the continuation of these lectures.

During 1940 many medical officers were specially trained in advanced hygiene with a view to their becoming hygiene specialists. This training was carried out by means of lectures, practical demonstrations and by attachment to the offices of Deputy Assistant Directors of Hygiene. This scheme proved to be a success and many competent hygienists were turned out during 1940. Special lectures and demonstrations on hygiene and sanitation were given to each class of emergency commissioned I. M. S. officers and I. M. D. personnel undergoing training at No. 1 Company I. H. C., Rawalpindi, throughout the year.

Great progress has been made during the year in the construction of Field Hygiene Demonstration areas; and in most large stations efficient demonstration areas now exist. The main defect in many of these areas is a tendency to construct over-elaborate appliances. It is wrong to build concrete grease traps, Horsfall's incinerators and Russian pits in a demonstration area which is meant to teach field hygiene to combatant officers, Viceroy's commissioned officers and men. The sight of such structures, which the majority will never again see, merely leads them to the conclusion that all sanitation is fantasy. Models should be simple, practical, absolutely correct in detail, and such as *will* be seen on active service. Moreover, the demonstration of several types of the same appliance should be avoided; and standard patterns which have proved to have been most suitable for active service should alone be shown.

F.—*Food and its control.*

The messing of British troops during the year has been satisfactory. The visits of the Inspector of catering have been most useful in ensuring that rations and money are expended to the best advantage. Since the increase in the messing allowance for British troops, the great majority of British units have been able to provide an excellent and ample dietary for their personnel without making any charge for extra messing. The difficulties which were expected to ensue, owing to the rising prices of imported food stuffs consequent upon the outbreak of war in September 1939, in maintaining the messing at a satisfactory level, proved during 1940 to be groundless. It has been found that the present rations plus the commuted ration and the messing allowances have been quite sufficient to provide the soldier with an attractive diet containing adequate calories. Units are now using the produce of local markets, and the consumption of such items as imported bacon, tinned sausage, tinned fish, etc., has been much reduced during 1940.

The increase of the messing allowance for Indian troops to Rs. 2 per mensem has been both popular and valuable. It is calculated that in a well organised unit, the daily nett value of the food eaten by an Indian sepoy is now over 3,500 calories, which is probably nearly double that of the food eaten by Indians of the same class in their villages. It is considered, however, that a daily issue of a pint of milk should be made to each recruit at training battalions and similar units, at any rate for the first month of his training. The physique of no human being responds so rapidly to a daily ration of milk as does that of the Indian lad, and it is considered that the small expenditure of money necessary to provide this ration would be more than repaid to the country by the great improvement in the growth and strength of the young Indian soldier. The question of this extra issue is at present under consideration.

The issue of an extra ¼ ounce of salt per man, which had bee made from the 15th May to the 30th September to certain units, both British and Indian, during 1937, 1938 and 1939, was discontinued in 1940. It cannot be said that any ill effects were proved to follow this withdrawal. It is true that there were outbreaks of heat exhaustion at Multan and Ferozepore but as already explained in paragraph 24, there were other and more obvious reasons for these outbreaks. Moreover, in none of the other stations in which extra salt was issued during 1937, 1938 and 1939 was there, as far as can be ascertained,

any less sickness during the years in which the extra salt was issued than before, nor any more sickness in 1940 which might fairly be attributed to lack of salt. At the same time, on intrinsic physiological grounds the issue of extra salt during the hottest months of the year *ought* to be beneficial.

The Military Food Laboratory, Kasauli.

Few people, other than those intimately concerned, realise what a valuable part the Military Food Laboratory plays in the maintenance of a high standard in the foodstuffs supplied to the army. The duty of the officer-in-charge of this laboratory is, by means of physical, chemical, biological and other examinations of samples submitted to him, to ensure that all food-stuffs supplied to the soldier is of first class quality. Throughout the year this laboratory, under able and skilled personnel, has examined and checked thousands of samples of supplies of all kinds. At times this checking has been held by some to be too severe ; but there is no doubt that the slightest relaxation of food control or of food standards would inevitably mean deterioration of the quality of the soldier's feeding.

There has been a great increase (approximately 85 per cent.) in the numbe of samples examined in 1940 compared to 1939. The staff of the laboratory has had to be augmented to deal with this increased volume of work, and is at the moment just able to cope with its task. The following table shows the number of samples examined during the last five years :—

TABLE 96.

1936	13058
1937	15320
1938	18012
1939	20328
1940	37290

The following table gives a Summary of the samples received for examination and the result of this examination :—

TABLE 97.

Summary of samples received at the Military Food Laboratory.

Source of Sample.	Total.	Approved.	Not approved.	Percentage not approved.
1. T(*a*) Registration of contractors.—				
Manufactured abroad	42	32	10	23·8
Manufactured in India	958	500	447	46·7
2. T(*b*). Tender samples.—				
Manufactured abroad	5	3	2	40·0
Manufactured in India	1,625	940	660	40·6
3. T(*c*) Special investigations.—				
Manufactured abroad	319	174	123	38·9
Manufactured in India	998	409	507	50·8
A. From bulk supplies before acceptance.—				
Manufactured abroad	158	119	40	23·7
Manufactured in India	3,849	3,266	550	14·3

TABLE 97—*contd.*

Source of Samples.	Total.	Approved.	Not approved.	Percentage not approved.
5. D. From bulk supplies from I. S. D. London	11	11	..	..
6. T/Y. From stocks twice yearly	5,465	5,083	250	4·6
7. T/Y-B. From stocks held in Burma	21	3	..	..
8. C. Complaints from stocks held anywhere in supply Depots.	1,470	890	529	35·9
9. E. Emergency supplies accepted without prior approval by M. F. L.—				
Manufactured abroad	1,300	1,188	62	4·8*
Manufactured in India	231	222	8	3·5*
Unexpired voyage rations	58	44	14	24·1
10. R(*a*). Revision samples from Ghi testing laboratory, Agra.	268	182	..	..
11. R (*b*). Revision samples from food inspection room, Bombay.	88	54	10	11·2
12. R (*c*) Revision samples from food inspection room, Calcutta.	4	2	2	50·2 28·2
13. B. From M. M. Government stocks held in India.	406	291	115	
14. G BS. From bulk stocks of grain accepted by the agents.	617	616	1	0·16
15. G/SA. From grains, dhalls, etc., set aside by the agents.	367	290	30	8·2
16. G/A. From grains, dalls, etc., for approval	853	836	14	1·6
17. G/CR. Form stocks of crushed grains to be issued to Supply Depots.	1,424	1,424	..	..
18. W/P Wheat products from Government controlled mills.	901	901	..	..
19. C/P. Sample for comparison of prices	63	21	8	10·6
20. H. Samples drawn by medical officers, or on any hygiene subject.	79	16	4	5·2
21. W. Water and sewage	75	..	..	..
22. K. From Director General of Foodstuffs in connexion with development of indigenous supplies.	94	13	15	15·7
23. Miscellaneous samples received, for which no authority has been sent.	20	..	..	..
24. Samples analysed at ghi testing laboratory, Agra.	15,521	15,203	..	..
Total	37,290	32,733	3,401	..

NOTE.— * Percentage unfit for issue.

The large number of categories used for the different varieties of samples is necessary to enable the laboratory to be organised into separate units dealing with samples under "mass production" methods. For instance a sample marked category "T/Y" (already government stock and perhaps stored

six months) requires only a cursory examination. A tender sample or a sample requiring special investigation (Category T/c) is on the other hand put to full analysis in a different department. Some samples are examined in two minutes, others take ten days; and in the case of biological estimation the full report is not usually available for one to two months.

The Categories " T/a " and " T/c " may next year (1941) be discontinued and included in Category " K ", development, as the work may then be performed by the Director General of Foodstuffs, Department of Supply. Neither of these categories, or even Category " T/b " shows the true aspect of quality as in both cases the samples are submitted from firms with financial interest in the sample. Category " A " samples, drawn by the supply officer before acceptance, gives a true index of the quality obtainable.

Category " E " was introduced in 1939 with the object of obtaining statistical evidence regarding those stocks which have been accepted without examination by the Military Food Laboratory, Kasauli, before purchase. The low percentage of non-approval is not comparable with other categories as the product is examined not to R. I. A. S. C., Specifications 1939, but to " whether fit for issue ". Fully 50 per cent. of these samples were not up to R. I. A. S. C. Specifications, 1939, but had to be utilised so that loss to the state should not occur. Two food inspection rooms, one in Bombay and one in Calcutta, were opened during 1940 to assist in the rapid examination of category " E " supplies at ports. Samples are revised at the Military Food Laboratory, Kasauli. (Categories " R/b " " R/c ").

The Military Food Laboratory, Kasauli, maintains effective control over all foodstuffs for Defence Forces, by repeated examination of samples drawn from supplies all over India. These supplies may be tendered, or submitted by contractors for acceptance, or Supply Depot stock.

The official standard of quality is R. I. A. S. C. Specifications, 1939, but in certain cases other lower standards were used, such as :—

(*i*) Not in accordance with R. I. A. S. C. Specification, but fit for issue during the war emergency. (Some slight defect in pack.)

(*ii*) Fit for issue to Defence Forces. (Usually no R. I. A. S. C. Specification, is applicable).

(*iii*) Fit for human consumption. (Below R. I. A. S. C. Specification but of fair average quality.)

All samples are, however, exmained to R. I. A. S. C. Specification where applicable, and no other standard is recognised by either the Supply or Medical Directorates.

Development (Category "K") is again one of the smallest groups, as little work was performed on the subject, the Military Food Laboratory not being authorised to participate. Only two products were examined which had hitherto been purchased outside India—marmalade and golden syrup. Both supplies proved unsatisfactory. The Military Food Laboratory, however, actively co-operated with the Director of Supplies and Transport on the development of dried potatoes, and a very satisfactory article is now under production. Further drying experiments on other vegetables are in progress.

The development of indigenous foodstuffs is now the responsibility of the Director General of Supply (Foodstuffs Directorate) and the Military Food Laboratory, Kasauli, has only been instructed to participate in the examination of the final samples from firms.

Samples of water and sewage effluent, and commodities of various kinds are included under Categories "H" and "W". They are mostly submitted by medical officers in charge of troops.

A large amount of special work necessitating lengthy and complicated analyses was performed, which has proved of great value to Defence Forces. This list includes :—

Preparation of ration biscuits from soya bean.
Preparation of gelatine from fish bladders.
Preparation of tapioca from the raw root.
Detection of mustard gas in foods.
Preparation of dried vegetables.
Ascorbic acid tablets (Biological).
Vegemite (Biological).
Calves foot jelly.
Parboiled rice (Biological).
Atta (Acidity).
Butter tinned, for Defence Forces.
Water sterilisation tablets.
Water bottles for Defence Forces.
Filter paper.
Marking ink for food containers.

The ghi testing laboratory, Agra, which is a branch of the Military Food Laboratory, Kasauli, is employed solely throughout the season on the examination of ghi for issue to Indian Troops.

This laboratory is very modern, and is also equipped for mass production methods, as some 120 samples are examined daily by a small staff. The following table gives a summary of the samples received at the ghi testing laboratory, Agra :—

TABLE 98.

Total number of samples received.	Number of samples recommended for		
	Acceptance.	Reheating.	Rejection.
15,521	15,203	318. (a) 312 excess acidity. (b) 6 excess sediment.	..

The quality of ghi issued by the ghi heating centre, Agra, surpasses anything found elsewhere in India for purity; but is a little below the best ghi privately marketed for age—that is—the acidity of the fat is high. In no case however is a ghi permitted to be issued with an acidity exceeding 3 per cent. reckoned as oleic acid (11 points).

G.—*Ordnance Factories and Workshops.*

There has been a very great increase in the output from Ordnance factories and workshops; and, as a corollary, considerable increases in personnel, who now work in shifts steadily throughout the week. It has been stated that the Indian workman prefers to work right through a shift rather than pause for a break, as is the custom in European and American factories. This is, however, in all likelihood merely a matter of custom; and it is probable that the system universally adopted in all highly industrialised countries as being most productive of work would also be found to be best in India. The clothing factory at Shajahanpur is now a modern hygienic establishment. It is well ventilated and improvements to artificial lighting have been satisfactorily carried out. Good provision has also been made for the workers to have " mid-shift " meals under clean conditions. Radio loudspeakers have also been installed for the entertainment of the employees. The Ishapore factory is also organised in the same system; and is a hygienic and modern concern. Water-borne sewage systems have been installed at Fort William and in the Ordnance factories at Cossipore and Ishapore. These have more than proved their worth in coping with the greatly increased personnel. Ferozepore Arsenal received criticism during the winter as being too cold. Conditions were definitely uncomfortable and were undoubtedly leading to a decrease in production. These defects have since been remedied.

In workshops in Western District various defects of lighting, ventilation feeding and periods for rest came to notice. These were remedied following medical representations.

All workshops and factories are provided with medical inspection rooms; and these were kept constantly busy during 1940 dealing with minor injuries and trivial ailments.

Diseases which could fairly be attributed to industrial conditions have, during 1940, been conspicuous by their absence among employees in Ordnance Establishments.

H.—*Hot Weather precautions.*

The practice of having reveille for troops later than was the old custom in the hot weather has been continued by most units, both British and Indian, during 1940. This is particularly beneficial to the young soldier. There is also a growing realization that it is better to keep men actively employed during most of the day throughout the summer; and the old pernicious belief in the beneficial effects of shutting men up in barrackrooms from 10 A.M. to 4 P.M. is gradually dying. That these lessons have not, however, been learnt by all is shown by the fact that two serious outbreaks of heat exhaustion which occurred in the middle of the hot weather were reported from British units which had reveille excessively early and kept their men shut up in barracks most of the day.

Owing to the great increase in troop movements during 1940, necessitated by war conditions, special measures were adopted to safeguard military personnel undertaking long train journeys in the hot weather, a period of the year during which in normal times travelling by train is restricted to a minimum. These special precautions included the provision of generous supplies of ice, minerals and of cold drinking water, the fast running of trains, the reduction of halts to a minimum, the provision of electric fans, adequate and suitable meals, entrainment as far as practicable in the early morning and always shortly before the time of departure. In addition all carriages were thoroughly sprayed with pyrethrum solution before entrainment, and special supplies of spray solution and spray guns were provided for the journey. Throughout the hot weather there were practically no ill effects from these trying journeys.

I.—*Sanitation in Barracks and Camps.*

Sanitation in barracks.—The sanitary endeavour of units in barracks has, on the whole, been satisfactory throughout India during 1940. The methods in force, however, for the removal of waste products are in most places more suitable for temporary camps than for permanent barracks. With few exceptions, the conservancy system for the disposal of faeces and urine is still made use of. In about half the barracks, faeces are incinerated; in the remainder faeces are conveyed in Crowly carts for distant disposal by trenching. The actual latrine seats for British troops are moderately well fly-proofed; but as the success of this method of fly-proofing depends on the user closing the lid, this method is far less desirable than proofing the complete latrine building. The principle has however been accepted that in all new construction for both British and Indian troops the entire building will be proofed. So that in time all latrines in India will be properly fly-proofed. Urine, in most places, is removed in Crowly carts, although in a gradually increasing number of stations, soak-pits are being constructed close to urinals.

Sullage water, almost invariably, is conveyed through barracks in open channels to be disposed of in a variety of ways, in vegetable gardens, soak pits disused shallow wells, open nullahs and land irrigation; none of which is wholly satisfactory. Household rubbish, pending removal, is stored in barracks in galvanised iron bins; and is subsequently removed in carts to disposal grounds outside barracks, where controlled tipping takes place.

Septic tanks.—Increasing mechanisation is making it difficult to obtain stable-litter as an aid to incineration. This was first felt acutely at Sialkot, as a result of which septic tanks have been installed in the lines of each large unit adjacent to each latrine. These septic tanks are fitted with fly-proof hoppers into which the contents of the latrine receptacles are tipped. The underlying principles on which these septic tanks have been constructed are that (*a*) each tank should have a capacity of 5 gallons per head of the population using it and (*b*) the effluent, without the interposition of any attempt at filtration, should be disposed of by underground agricultural drains. This system has now been in force in Sialkot for over a year with complete success. The underground disposal of the effluent is perfectly satisfactory, in spite

of the fact that the soil is a heavy and relatively impervious loam; and the whole procedure is devoid of smell.

It is generally agreed, by those who have had practical experience of this method, that wherever *properly designed* septic tanks have been installed in India, under suitable conditions, they have given complete satisfaction. It is extremely rarely that the soil fails to accept the effluent, provided that the area fed by the agricultural drains is reasonably large and that the drains are not placed too far below the surface. Often indeed, when this area is unreasonably small, the ground still deals efficiently with the effluent. At a certain club in India a small and badly designed septic tanks has been in use for over ten years. Although this tank is constantly and grossly overloaded, the effluent drains have never in the whole of that time given any trouble. In many married quarters in Peshawar there are septic tanks which have neither given any trouble nor even had to be sludged since they were first installed over five years ago. It seems to be clear that in the soil's ability to deal with an effluent from a septic tank, filtration does not play the major part but that such other factors as aeration, biological action, plant and animal life, etc., are of greater importance. It also seems to be clear that to get the best results the agricultural drains should never be more than two feet below the surface and preferably not more than eighteen inches. It is considered that the carriage of faeces by water into septic tanks holds out great prospects for barrack sanitation of the future in those places in India in which the fall of the ground, or lack of capital, prohibits more orthodox methods of sewage disposal. It is considered that, owing to the great ability of the upper two feet of the soil to deal with tank effluent, there is small danger of the ground becoming sewage-logged; unless, indeed, the subsoil water approaches within a few feet of the surface. The danger to water supplies, particularly as more and more military stations in India are being provided with modern water plants, is also thought to be negligible.

It has been suggested that a convenient way to dispose of the tank effluent is to lead it down a shaft to subsoil water. This method which is analogous to Yeager's bored—hole latrine, is certainly an effective way of disposing of the effluent, provided the subsoil water is a fair depth below the surface (fifteen feet or so). There is however very much greater danger of polluting sub-soil water over a large area than with the agricultural drain method, a matter of importance if the community in question derives its water supplies from shallow wells.

Camp Sanitation.—The importance of camp sanitation became very evident during 1940. Not only were mumerous " columns " out in Waziristan throughout the year as well as actual large scale operations in the Ahmedzai salient in April and May, but numerous camps sprang up all over India in connection with the expansion of the Army.

The sanitation in Waziristan in all camps occupied by the troops was good ;and once again " tight-packing " of horse manure proved to be a success.

On the other hand, sanitation in the coolie camps in Waziristan, which were often sited, for reasons of their security, within a hundred yards,

or less, of the troops camps were most unsatisfactory. In theory, the sanitation of these camps is the responsibility of the coolie contractor, but in actual practice nothing is done until the military medical authorities take over charge. By this time, as a rule, the coolie camps have got into such an insanitary condition that the lost ground is with difficulty made up. The most vital necessities are latrine-pans and incinerators. The former can be purchased from Ordnance and the latter can be built by the M. E. S. at the expense of the contractor. The simplest and best plan, however, is for the M. E. S. to provide the pans and incinerators before the camp is occupied by the coolies, and to deduct the cost from the contractor's pay. This, unfortunately, can only be done with the consent of the contractor.

In the camps occupied by troops in connection with expansion, sanitation was of the semi-permanent camp type, and was generally satisfactory. Faeces were, as a rule, disposed of by incineration or by removal in Crowly carts, urine by soak pits or removal, surplus litter by "tight-packing" (actually where incineratiou of faeces was in force there was very little to tight-pack as most was used as an aid to incineration of faeces), solid cookhouse refuse by burning, and sullage water by soak-pits.

As always, however, the trouble was the hordes of coolies and labourers who were employed on the camp sites before the troops moved in. It usually took several days when the camp was eventually occupied by the troops to clean the ground in and around the camp, which had been used indiscriminately by the coolies for defaecation. Even when these camps came under full military control, the labourers employed on making roads, building huts, levelling sites, etc., were a constant source of trouble and of danger.

J.—*Water Supplies.*

Very great improvements have taken place in the past twenty-five years in the water supplies of military cantonments in India; and these improvements are each year, slowly but gradually, been added to. The water situation in most stations of Brigade size and upwards is now satisfactory, with a chlorinated pipe supply to the barracks. There are still, however, some exceptions. Plans to improve the situation in these places have been held up owing to the war. The situation in the majority of the smaller stations is little changed from what it was twenty-five years ago.

The situation regarding the supply of water to military populations in India has been fully discussed in these report for the past few years; and it is only intended now to mention those supplies in which any change has taken place in 1940.

Abbottabad.—A considerable strain was thrown on this water supply by the location of Nepalese troops at Kakul from March to October 1940. The difficulty was overcome by constructing a storage reservoir to hold the over flow from the Kakul spring, which formerly ran to waste. It is expected that this reservoir will be of use after the war in improving the water supply to Abbottabad.

Jhelum.—The scheme for putting all barracks in Jhelum on to a piped chlorinated supply at a cost of Rs. 8,000 has been postponed owing to the war. The Jhelum water supply is unsatisfactory, particularly at present with expansion taking place. Only three barracks are supplied by piped chlorinated water, the remainder of the station having to depend on old shallow wells. In some, an attempt is made to chlorinate the water in the well, in others there is no attempt at chlorination. Arrangements, however are in train to provide tanks in all lines in which the water can at least be chlorinated by hand.

Amritsar.—This supply which is entirely from open shallow wells gave trouble during 1940, particularly one well in the British Infantry lines. Mule standings within 100 feet of the well were considered to be the cause of the pollution; and, on their removal, the quality of the water improved.

Dalhousie.—The water supply in this hill station is not very satisfactory The military supply is derived from a catchment area, the water being collected in storage tanks in which it is chlorinated. In 1940, following heavy rain, these tanks became filled with debris and the supply had to be run direct (the collecting tanks being cut out of the system) to the cantonment, chlorination being carried out in local service tanks. The storage tanks are sited in a particularly unsuitable place, being in the course of a nullah running down from Bakrota hill on which are situated several bungalows. When a spate occurs, debris from the bungalows is liable to be washed into the tanks. In 1940 a V-shaped protecting wall was built; but, even so, this water supply requires re-planning.

Razmak.—The sole supply is from two tube-wells sunk inside the fort. Although the water is of excellent quality, the quantity produced is insufficient to meet the needs of the garrison, and great economy is necessary to eke it out. The supply is, of necessity, intermittent; and water is only available from the pipes for one hour thrice daily. A third well is about to be sunk.

Agra.—A new tube-well system has been taken into use, and has proved to be satisfactory.

Dehra Dun.—Complaints were received from both military schools that water from a P. W. D. source separate from the military supply contained so much suspended matter that drinking it caused alimentary troubles. This was not corroborated by an examination of their medical records. A complaint, however, that the water was so hard that it was impossible to cook pulses in it was substantiated; and steps were taken to reduce the hardness.

Quetta.—This station has been feeling the pinch caused by expansion and a diminished rainfall. A new water sterilization plant is being installed by Messrs. Candy consisting of rapid open sand filters and automatic chlorination.

Hyderabad, Sind.—The only supply is from Municipal sources, which are unsatisfactory. So indifferent is this water that military consumers sediment and treat their own portion of the supply. It is hoped eventually to install separate military plant.

Water supplies in Expansion Camps.—The principles followed were sedimentation by alum in storage tanks, followed by chlorination in service tanks. The system on the whole worked well.

A certain camp, holding a brigade, was situated close to a large civilian commercial concern which had its own abundant piped water supply. This supply superficially appeared to be modern in every respect; and it was desired to use it for the camp by tapping in on the main. Enquiry, however, revealed that the water was not chlorinated, the manager of the concern assuring the military authorities that it was a very pure supply and that chlorination was unnecessary. Investigation by the Assistant Director of Hygiene of the Command, however, revealed that the source was a shallow stream at the side of a main road from which water was pumped direct to the taps in the houses of the "colony". Search along the banks of this stream revealed the fact that the stream within a few yards of the intake pipe was obviously used as an abdast by all and sundry. A separate military chlorinated supply was therefore installed for the camp. A month later an outbreak of cholera occurred in the same neighbourhood which was strongly suspected, although not definitely proved, to be caused by drinking water from a similar stream about a mile away.

Verdunisation of water supplies.—As the result of a report issued by the Director, King Institute, Guindy, that sterilization of turbid water could be successfully carried out by minimal doses of chlorine (*i.e.*, 0·2 parts per million, or less) when combined with agitation of the water by a centrifugal pump, carefully controlled experiments were performed by the Deputy Assistant Director of Pathology, Rawalpindi. The results of these tests did not confirm the claim made by the King Institute.

Water supplies in Internees and Prisoners of War Camps.—The same principles were followed as for Expansion Camps. Great difficulties were however, experienced owing to the "rush" nature of the work; for example, a camp was prepared for a certain number of prisoners; and, when nearly ready, had to expand to receive nearly four times this number within a few weeks.

This sort of thing made the water supply problems somewhat difficult. The situation, however, is now in hand.

PATHOLOGY.

Routine work again showed an increase during 1940. A total of 383,437 specimens were sent to military laboratories for examination during the year, 146,909 more than last year. This annual increase, which has taken place for some years past, is undoubtedly due this year to the increase in the number of patients in military hospitals compared to former years which followed as a corollary on the expansion of the army in India owing to the war. A very large increase also occurred in the routine examination of menials prior to employment. It is interesting to note that the increase recorded this year is practically the same as the total number of examinations completed during the year 1935.

All laboratories contribute to this increase, but it is most marked in the following :—

Southern Command Laboratory, Poona 65,350 in 1940 ; 39,947 in 1939.
Enteric Laboratory, Kasauli, 4,793 in 1939 ; 14,520 in 1940.
District Laboratory, Razmak, 12,620 in 1939 ; 19,678 in 1940.

A larger number of examinations was also carried out in clinical side rooms of hospitals in connection with malaria, dysentery cases and chemical examination of urine etc. In many cases parent laboratories remarked in their reports that the findings recorded by clinical side rooms were frequently checked with most satisfactory results. This is gratifying and praiseworthy as officers commanding hospitals have experienced many difficulties during the year owing to frequent changes of staff both superior and subordinate.

Enteric group of fevers.—Repeated widal tests were carried out on all cases suspected of Enteric group infection from whom no causative organism had been isolated. A total of 71 cases were diagnosed " group " infection throughout the year, which represented 21 British and 50 Indian. Of these, 15 were serologically negative and were diagnosed on clinical grounds only. The great majority of cases, as noted for the past two years, were mild in type with few symptoms other than pyrexia and a slow pulse. The average pyrexial period for the above cases was 14 days. In last year's report it was emphasised that the diagnosis of enteric group in the absence of definite serological findings was too readily made. All laboratories were circulated to this effect but it is still felt that many of these cases are diagnosed on very slender evidence. In this connection, however, it must be realised that the recording of widal tests carried out on heavily inoculated individuals is often of small diagnostic value

T O and A O suspensions supplied by the Enteric Laboratory, Kasauli. were universally employed by military laboratories when carrying out tests in connection with these cases. A steadily rising titre to T. O. and A. O. antigen is very suggestive of an infection with an organism of the enteric group but it is now universally agreed that one or more high titres unless part of a definite curve are no evidence, for or against an enteric group infection

The investigation concerning the production of VI anti-bodies in the blood, mentioned in last year's report was continued throughout 1940 by all military laboratories in India. Suspensions of Vi strains were as before prepared and issued by the officer-in-charge Enteric Laboratory, Kasauli, who was also responsible for correlating results received from the various laboratories.

In a previous report he emphasised the marked diversity of the results obtained by different laboratories. Two factors, it was considered, were responsible for the very marked divergencies noted.

The first, and more important, was the lack of uniformity in the estimation of the end-point of agglutination. The second factor, which attributed to the difficulty in estimating the end point was the great liability to accidental contamination and the resultant growth of extraneous organisms in the medium during the 24 hours incubation period at room temperature, which was particularly liable to occur in plain stations during the hot weather.

Suitable instructions were issued to all laboratories in order to overcome the above-mentioned difficulties, with the result that the findings of the different laboratories during the year under review showed a much closer agreement in the majority of the classes or cases examined.

The nature of the investigation undertaken during 1940 was similar to that undertaken in 1939 but a far larger number of cases was investigated; actual tables showing results obtained are not included in this report as was done last year, but the following is a summary of conclusions which have been arrived at, as the result of careful scrutiny of all investigations undertaken.

1. Vi agglutinins are absent in 93 per cent. to 98 per cent. of healthy uninoculated individuals.

2. Vi agglutinins are present to titres of 1/20 or over in 15 per cent. of healthy, inoculated individuals.

3. An appreciable rise in Vi antibodies is rare in diseases other than typhoid.

4. In typhoid fever 75 per cent. of the cases show a rise in Vi agglutinins to titres of 1/20 or over; in 60 per cent. the titre is 1/40 or over, while in 25 per cent. the titre does not reach 1/20.

5. For satisfactory and critical results, the test must be performed with meticulous care and a rigid standard adopted in the estimation of the end-point.

6. The significance of the Vi agglutination test should be assessed not as a separate entity, but in conjunction with the other clinical and pathological data to hand. With this proviso and with the more exacting standards of estimating the end-point, a Vi titre of 20 in a patient suffering from continuous fever should be regarded as strong presumptive evidence of Bacterium typhosum infection. As the titre increases, the significance is correspondingly increased.

Isolation of enteric group organisms from blood culture.—A total of 5024 blood cultures was taken during the year from cases suspected to be suffering from enteric group infections. The following is a summary of successful isolations from individual cases, duplicate isolations from the same case not being included. B typhosum 109, B paratyphosum A 54, B paratyphosum B 4, and B paratyphosum C i. The average day of isolation was the 6th day after the onset of the disease.

Of the total cultures 8 per cent. were found to be contaminated, which is considerably less than last year and half the percentage recorded in 1936.

The practice of adding gentian violet in a dilution of 1—16,000 to sodium taurocholate medium used for blood culture was continued throughout the year.

There is little doubt that the greatly reduced contamination rate is due to the use of this dye. In one laboratory the dilution employed was 1—30,000 and it was found that this strength was sufficient to inhibit the growth of staphylococcus albus, one of the most common contaminating organisms. The officer-in-charge of one laboratory considered it possible that the addition of the gentian violet had an inhibitory effect on the pathogenic

gram negative bacilli, so that the lag phase of growth was prolonged to as much as 14 days or longer. In order to prove or disprove this hypothesis the officer-in-charge Enteric Laboratory, Kasauli, carried out the following investigation which showed that the presence of gentian violet in the dilution recommended caused no appreciable lag in the growth of Bacterium typhosum.

Four bottles of ox-bile gentian violet were each inoculated with 5 c.cs. of sterile blood taken from a typhoid convalescent.

Serial dilutions in saline were made of an 18 hour broth culture of Bacterium typhosum, and each of the four bottles of prepared blood cultures was inoculated with 0·1 c.c. of the dilution 10^4 to 10^7.

Viable colony counts carried out on these dilutions indicated that the number of organisms present in each case were :

10^4	45
10^5	15
10^6	*Nil.*
10^7	*Nil.*

The cultures were incubated for 24 hours, and viable colony counts carried out on each. The results of these were :

	Inoculum.	Viable organisms after 24 hours.
1st Culture	45 organisms.	151·000·000 per c.c.
2nd Culture	15 organisms.	52·000·000 per c.c.
3rd Culture	*Nil.*	Sterile.
4th Culture	*Nil.*	Sterile.

From the above it would appear that the presence of gentian violet in the dilution used causes no appreciable lag in the growth of Bacterium typhosum.

Isolation of enteric group organisms from faeces and urine.—The isolations of enteric group bacilli from faeces were 78 (B. typhosum 64, B. paratyphosum A. 14). The number of isolations is greater than last year's total which was 46, but the increase has coincided with a corresponding increase in the number of isolations from blood culture. The figures are considered to be satisfactory as there is little doubt that isolation of organisms from heavily inoculated individuals present many difficulties.

Organisms of the enteric group were isolated from the urine of patients on 48 occasions. The Officer-in-charge, District Laboratory, Quetta, has continued the practice of having specimens of urine cultured in medium in screw capped bottles. The medium is a double strength broth of which 10 c.cs. are placed in 1 oz. screw capped bottles. To each is added an equal amount of the urine to be cultured. Special batches containing gentian violet are used for the culture of enteric and coliform organisms, using this technique B typhosum was isolated six times and B coli 129 times during the year.

As a result of the employment of this method it was discovered that B. pyocyaneous, also certain strains of enterococcus, and urinary staphy lococcus albus were resistent to gentian violet.

One case of typhoid fever exhibited unusual features and is worthy of special mention. A British soldier was detained in a field medical unit diagnosed N.Y.D. fever and blood for culture removed on the third day of his fever. He was evacuated to a main hospital where on arrival his symptoms were only those of sinusitis; and, as his blood culture proved to be sterile after forty-eight hours incubation, he was discharged to duty. After regular subculturing, the blood gave a positive result for B typhosum for the first time on the twenty-third day of culturing. The soldier, who had been perfectly well since discharge from hospital twenty-one days before, was re-admitted to hospital and B typhosum was then isolated from his urine.

The following three points are illustrated by this case.

1. That mild atypical cases of enteric fever occur in India, probably only among inoculated individuals, which are certain to be missed unless the routine for the investigation of undiagnosed fever cases is rigidly adhered to.
2. The dangerous nature of these cases.
3. The importance of prolonged incubation of blood cultures in all cases.

Organisms sent to the Enteric Laboratory Kasauli, for confirmation or identification.—Six hundred and seventy-two organisms were sent to the Enteric Laboratory during the year and were classified as follows:—

	1940.	1939.
Bacterium typhosum	140	103
Bacterium paratyphosum A.	61	39
Bacterium paratyphosum B.	3	4
Bacterium paratyphosum C.	1	..
Bacterium typhi-murium	1	1
Bacterium reading	..	1
Bacterium enteritidis	..	1
Bacterium faecalis alkaligenes	4	5
Bacterium columbense	1	..
Brucella melitensis	1	1
Neisseria meningitidis	1	1
Vibrio cholerae	1	..
Paracolon and unclassified	11	16
Total ..	225	174

Although the above figures do not give an accurate indication of the incidence of the enteric group of fevers in the army, as cases diagnosed on clinical or serological grounds are unaccounted for, nevertheless it may be inferred, other things being equal, that there has been some increase in such fevers during the year.

Two districts are mainly responsible for this increase, Quetta and Lahore. In the former an outbreak of typhoid fever occurred among the families of the Indian personnel, the majority of whom were presumably unprotected. In the latter both typhoid and paratyphoid fever occurred on a fairly extensive scale in both British and Indian troops; but the disease in so far as it

affected the British personnel, appears from case reports to have been extremely mild, many of the cases having a pyrexia of from three to five days duration.

It is not therefore considered that these outbreaks detract in any way from the efficiency of the protection afforded by the present T.A.B. vaccine.

The preliminary identification tests carried out by the various laboratories were on the whole very satisfactorily performed, and the number of para-colon bacilli submitted as members of the Salmonella group showed a decrease. In this connection it is pointed out that the majority of para-colon bacilli forwarded, were sent for opinion, rather than in the belief that they were members of the group.

Bacterium faecalis alkaligenes.—This organism was isolated on four occasions from blood culture, three cases occurring in one station. Homologous agglutinins were present in the blood in each case. Two of the strains were antigenically similar to strains maintained in the Enteric Laboratory, and recognised as probably capable of giving rise to an enteric-like fever; the remaining two were antigenically distinct from the stock strains, but were themselves antigenically similar; and as homologous agglutinins were present to the relatively higher titre of 250, this strain has been added to those already held in the Laboratory as probably of pathogenic significance.

Enteric Convalescent Depot, Kasauli.—All British troops diagnosed enteric group infection during the year were again automatically sent to the Enteric Convalescent Depot, Kasauli, for examination and test for a carrier condition. For Indian troops, the necessary examination to exclude the carrier condition are undertaken by local military laboratories.

The number of admissions to the Depot was the same as that of the previous year, namely 38.

The following table shows the number of convalescents received compared with the previous four years.

TABLE 99.

	1940.	1939.	1938.	1937.	1936.
Typhoid	9	14	14	4	13
Paratyphoid fever A. ..	19	6	2	3	11
Paratyphoid fever B. ..	1	2	3	2	1
Paratyphoid fever C. ..	..	..	..	..	1
Enteric group	9	15	19	25	37
Others	..	1	..	1	..
Total ..	38	38	38	35	63

Three points in the above table are worthy of comment:

1. The very appreciable reduction in the number of cases in whom the casual organism was not isolated, and in which a diagnosis of enteric group had to be made. The fact that out of a total of 38 cases of enteric fever among British troops in India, excluding any fatal cases that may have occurred, the casual organism was isolated in approximately 77 per cent. is indeed commendable.

2. The appreciable further decrease in cases of infection by Bacterium typhosum among British troops in India.

3. The increase of Paratyphoid A infections—three times as many as in the previous year: and nearly ten times as many as in 1938. This in itself might give cause for thought were it not, as already remarked on, the majority of these cases occurred during the mild, though extensive, outbreak of Paratyphoid fever in Lahore, which was in itself responsible for 16 cases.

No cases of carrier condition, temporary or permanent, was found among the convalescents.

Dysentery.—Specimens from 6,485 cases of dysentery and 4,621 cases of diarrhœa were bacteriologically examined during the year 1940. A total of 22,534 bacteriological examinations were carried out in connection with these cases, which is over 6,400 more than last year. There were 230 cases of amœbic dysentery and 14 cases of mixed bacillary and amœbic infection. Typical bacillary exudates were present microscopically in 58 per cent. of the cases which curiously is exactly the same percentage as the past two years.

The percentage of isolations of organisms from cases with typical exudates varied in different laboratories from 91 to 51 per cent. Results on the whole must be considered as having been most satisfactory. Table 100 shows percentage of isolations by Commands.

TABLE 100.

Comparative statement showing percentage of isolations of dysentery organisms by Commands, 1940.

		Typical bacillary exudate.				Indefinite exudate.				Prcentage of total cases from which dysentery organisms were isolated.		
	Total cases.	Number of cases.	Percentage of total cases.	Number of cases from which organisms were isolated.	Percentage of column 5 with column 3.	Number of cases.	Percentage of total cases.	Number of cases from which organisms were isolated.	Percentage of column 9 with column 7.	Typical bacillary exudate.	Indefinite exudate.	Total.
1	2	3	4	5	6	7	8	9	10	11	12	13
Northern Command ..	2,788	1,770	63·49	1,543	87·17	1,018	36·5	507	49·8	55·34	18·19	73·53
Eastern Command ..	1,571	880	56·52	696	79·09	691	43·91	408	59·05	44·30	25·97	70·27
Southern Command ..	1,742	1,004	57·63	820	81·67	738	36·75	397	53·79	47·07	22·79	69·86
Western (I) District ..	384	221	57·63	182	82·35	163	42·44	64	39·26	47·39	16·67	64·06

The satisfactory percentage of isolations of dysentery organisms is, it is felt, largely due to co-operation of hospitals with laboratories and to the employment of the buffered glycerine and saline solution referred to in last year's report.

Northern Command again this year head the list of successful isolations. As previously stated, there were 230 cases of amœbic dysentery throughout the year of which 94 occurred in Northern Command. The incidence of this number of cases points to the fact that amœbic dysentery is not so rare that the possibility of E. histolytica being the cause of an attack of dysentery, specially in chronic relapsing cases, should even be overlooked. The employment of glycerine and saline solution for sending specimens to laboratories, naturally, prevents any examination for vegetative amœba being carried out. In all hospitals, however, when a case does not respond to saline treatment, arrangements are made for an examination of fresh specimens of mucus taken in many cases by means of sigmoidoscopic examination.

As in previous years, isolations of bacillary dysentery organisms from outstations were poorer than those in which a laboratory was situated.

Types of dysentery organisms isolated.

A total of 2,296 Andrews types of B. flexner were isolated during the year, this is an increase of 901 when compared with 1939. The Boyd strains also showed an increase in number of isolations and totalled 490. Type D. 19 was again this year far less common than others and was only isolated on one occasion by a laboratory situated in Northern Command.

Work has continued in the Enteric Laboratory, Kasauli, on the preparation of mono-valent type specific sera for the accurate typing of dysentery organisms.

The distribution of the various strains of dysentery bacilli throughout the four Commands during 1940 is shown by laboratories in Table 101 and the percentage of each group in each Command in Table 102.

It is regretted that owing to insufficient data it has not been possible this year to adopt Boyd's new classification of the mannite fermenting dysentery organisms.

TABLE 101.

Analysis of types of dysentery bacilli isolated during 1940, and positive results for E. histolytica.

Commands and Laboratories.	Group A-1 B-Flexner Andrew's strains V. W. X. Y. Z.	Group A-2 Boyd's strains, 103, 170 and 119.	Group B Boyd's strains, 88, 288 D-1, 274.	Group C B-Sonne.	B Shiga.	B Schmitz.	Entamoeba histolytica.	TOTAL.
Northern Command.								
Kasauli	10	6	4	1	2	..	1	24
Peshawar	210	11	9	56	50	52	5	393
Kohat	72	3	3	24	6	43	1	152
Razmak	208	10	13	10	28	33	33	335
Rawalpindi ..	98	23	23	41	72	7	4	268
Lahore	123	1	2	25	45	6	2	204
Bannu	222	6	8	46	48	40	8	378
Sialkot	22	..	6	..	..	4	..	32
Ambala	16	1	..	8	3	..	12	40
Abbottabad ..	88	26	6	31	11	6	..	168
Total ..	1,069	87	74	242	265	191	66	1,994
Southern Command.								
Poona	203	4	19	119	23	28	13	409
Bombay	60	3	1	..	13	1	5	83
Bangalore ..	54	9	17	26	12	29	2	149
Trimulgherry ..	162	20	13	23	53	7	5	283
Jubbulpore ..	66	4	12	57	32	10	3	184
Mhow	33	7	6	28	6	..	5	85
Total ..	578	47	68	253	139	75	33	1,193
Eastern Command.								
Meerut	53	13	25	14	2	5	4	116
Lucknow	91	10	10	41	22	1	7	182
Calcutta	79	2	5	36	6	10	73	211
Delhi	8	1	2	..	7	..	..	18
Bareilly	55	7	16	8	17	10	5	118
Dehra Dun ..	42	4	5	13	12	5	25	106
Jhansi	160	25	31	39	2	37	9	303
Allahabad ..	48	..	..	2	12	..	11	73
Total ..	536	62	94	153	80	68	134	1,127
Western (I) District.								
Quetta	76	32	31	24	29	11	2	205
Karachi	37	1	2	..	..	..	..	40
Total ..	113	33	33	24	29	11	2	245
Total All India 1940	2,296	229	269	672	513	345	235	4,559
Total All India 1939	1,395	195	273	474	298	181	129	2,945

TABLE 102.

Percentage of types of dysentery bacilli isolated in the Commands during 1940 and percentage of positive results to E. histolytica.

Command.	Total.	Group A-1 B-Flexner Andrew's strains V. W. X. Y. Z.	Group A Boyd's strains 103, 170 and 119.	Group B Boyd's strains 88, 288 D-1, 274.	Group C B Sonne.	B. Shiga.	B. Schmitz.	Positive Entamoeba histolytica.
Northern	1,994	53·6	4·4	3·7	12·1	13·3	9·6	3·3
Southern	1,193	48·4	3·9	5·7	21·2	11·7	6·3	2·8
Eastern	1,127	47·6	5·5	8·3	13·6	7·1	6·0	11·9
Western (I) District	245	46·1	13·5	13·5	9·8	11·8	4·5	0·8
Average all India 1940 ..		50·4	5·0	5·9	14·7	11·3	7·6	5·2
Average all India 1939 ..		47·3	6·6	9·2	16·1	10·1	6·1	4·3

In table 102 it will be seen that there is really little difference between Commands in the percentages of the various infections to the totals in the Command. The all India percentages for the years 1939 and 1940 are even more close. These figures represent careful work in 26 laboratories situated in different parts of India. Similar figures from civilian sources are not yet available.

Routine examination of menials prior to employment.—A total of 26,467 menials were examined during the year prior to employment. This represents a total of 72,662 actual examinations, an increase of 28,405 compared with last year. As a result of these examinations organisms of the dysentery group were isolated on 33 occasions which is a slight increase from last year ; organisms of the enteric group were isolated on 7 occasions only.

Microscopical examinations for the presence of Entamœba histolytica cysts were not carried out as a routine measure, but in many laboratories were voluntarily undertaken for instructional purposes. Sixty-three thousand seven hundred and seventy-seven examinations of this nature were carried out, and cysts demonstrated on 69 occasions only.

All the above stools were also examined for helminth infection. The following table illustrates the findings in each Command.

TABLE 103.

Command.	Taeniidae.	H. nana.	Ascaris lumbricoides.	Ankylostoma type.	Trichuris trichiura.
Southern	9	38	406	591	178
Eastern	26	46	567	1,063	102
Northern	12	46	188	1,273	183
Western (I) District ..	..	..	7	31	2

The amount of work entailed in carrying out all the above examinations can be imagined, and it is very doubtful if results obtained justified the energy, time and materials expended.

Testing for the presence of Vi antigen in the serum was undertaken again this year by certain laboratories in order to help in the detection of carriers of B. typhosum, but the results obtained were again disappointing.

Diphtheria.—Throat swabs from 3,810 individuals suspected of suffering from diphtheria were examined during the year, of whom 167 were positive for C. diphtheriæ. In all 5,368 bacteriological examinations were made, 305 being found positive.

The positive cases occurred in Commands as follows : Northern Command (65), Eastern Command (29), Southern Command (66), and Western (I) District (7).

Nasal swabs from 929 suspected cases were bacteriologically examined with positive findings on 22 occasions. Again this year all virulence tests were carried out by injection and post-mortem examination of guinea pigs, although on occasions the intra-dermal test was also employed.

During the year, small outbreaks of diphtheria occurred at Razmak, Sialkot and Gora Gali represented by 24, 14 and 7 cases, respectively. Routine examinations for carriers were undertaken and both virulent and avirulent types of C. diphtheriæ were isolated from apparently healthy individuals.

Cerebro-spinal fever.—A total of 105 individuals were diagnosed cerebro-spinal meningitis during 1940, positive cultures of meningococci were obtained from 60. The majority of the remaining cases were diagnosed as the result of examination of deposits in outstations where laboratory facilities for bacteriological examination did not exist. Of the 60 positive cultures 9 belonged to Group I and 36 to Group II, the remainder not being classified.

A total of 378 cultures from cerebro-spinal fluid of cases of varying nature, including the above, were made during the year, the great majority of which were as last year from laboratories situated in Northern Command (204), cell counts totalled 374, microscopical examination of deposits 369, Lange's gold chloride test 80, and chemical examinations, *e.g.*, globulin, chlorides etc. 401. Two hundred and forty-seven Wassermann tests were carried out on cerebro-spinal fluid in Poona, Meerut, Rawalpindi and Quetta.

Fevers of the typhus group.—A total of 93 cases was diagnosed typhus fever on serological grounds, during the year. The following table shows the type of infection and Commands in which the cases occurred.

TABLE 104.

Command.	OX 19.	OX 2.	OX K.
Northern	23	4	20
Southern	18	5	3
Eastern	3	2	15
Western (I) District	..	..	..
Total all India ..	44	11	38

Investigations were continued throughout the year in an endeavour to discover the vector of these fevers, but without result. Few of the cases gave any history of tick or other bites, but one officer was quite definite that whilst walking through forest land he picked off five ticks which had bitten him through his stockings. Within fifteen days he developed pyrexia.

Brucella group infections.—Fourteen cases were diagnosed on serological grounds throughout the year, and in one further case the causative organism was isolated from blood culture. Seven of the above cases occurred in Western (I) District. The cause of infection was traced in one case only, that of a British officer who gave a definite history of having drunk a glass of unboiled goat's milk, on his return from column, some weeks prior to the onset of the disease. In spite of every effort having been made, including growth under reduced oxygen tension, no causative organism was isolated from any of the above-quoted seven cases.

Anæmias.—In order to standardise the method of diagnosis and treatment of different types of anæmia, notes summarizing the modern views on this subject, were prepared by the D. A. D. P., Peshawar District (Major T. C. Puri, I.M.S.) and circulated to all medical officers in India. This officer investigated and classified 135 cases of anæmia and came to the conclusion that the type of anæmia most commonly encountered was of the hypochromic and mixed (both macro and microcytic type), which pointed to a double deficiency of iron and liver factor.

As the result of his investigations during 1940 he concluded that anæmia was (*a*) extremely rare among British troops, (*b*) not uncommon among British women, (*c*) common among Indian troops, and (*d*) probably very common among Indian women.

It is probable that the main cause of the high incidence of anæmia among Indians is malaria and ankylostomiasis ; but deficiencies of the various blood forming factors, whether the result of nutritional defects or secondary to gastro-intestinal disorders, also play an important part.

Blood grouping.—In November 1940 orders were issued to the effect that all British personnel in India and all Indian recruits should be blood grouped and an appropriate entry stamped on the reverse side of identification discs.

The technique of the test was demonstrated to medical officers by officers in charge of laboratories, and in many cases written instructions for carrying out the procedure with citrated blood were issued to military hospitals. Any additional equipment required by clinical side rooms and typing sera were supplied by laboratories.

Laboratories performing Wassermann tests had no difficulty in obtaining ample supplies of sera, in the case of other laboratories supplies of A (2) and B (3) group sera were obtained from volunteers.

A check of 5% of tests carried out by medical officers was undertaken by all officers commanding laboratories. The result of this check was in practically all cases excellent and very few errors in grouping detected. In one area however, it was discovered that grouping sera had been wrongly labelled

with the result that over 1,500 individuals had to be re-grouped. This one mistake emphasised the importance of carrying out the 5% check on individuals tested and although it increased the work of laboratories very considerably was fully justified.

Supply of diagnostic sera and agglutinable suspensions.—All diagnostic sera and agglutinable suspensions were as usual prepared and issued to military laboratories by the Officer in charge, Enteric Laboratory, Kasauli. During the course of the year the amounts prepared and issued were as follows :—

	1940.	1939.
I.—*To military laboratories in India*—		
	ccs.	ccs.
Agglutinating sera	5,619	5,344
Agglutinable suspensions—		
Standard	3,000	4,450
Concentrated	17,732	13,160
II.—*To The Medical Store Depot, Bombay*—		
Agglutinating sera	64	*Nil*
Concentrated agglutinable suspensions ..	80	*Nil*
III.—*To military forces overseas*—		
Agglutinating sera	320	*Nil*
Agglutinable suspensions—		
Standard	1,550	*Nil*
Concentrated	550	*Nil*
IV.—*To civil institutions and private practitioners*—		
Agglutinating sera	309	210
Agglutinable suspensions—		
Standard	39,900	37,050
Concentrated	3,175	1,800

The above figures shew a considerable increase in the issue of sera and suspensions both to civil institutions and to Military laboratories, as compared with those of 1939. As regards civil institutions, this increase is in part attributable to the war, as several institutions who prior to the war obtained their requirements from England are now being supplied by the Enteric Laboratory.

The increase of supply to military laboratories is chiefly due to the increased supply of Vi and R.V. antigens. Early in the year an appeal to all laboratory workers was made to carry out as many Vi agglutination tests as possible, not only in cases of enteric fever but also on healthy inoculated and uninoculated individuals so that the value of the Vi agglutination test as a diagnostic measure might be assessed.

In comparing the material supplied to military laboratories and civil institutions, a striking factor is the marked difference in the amount of diagnostic sera supplied to the former as compared with the latter. This is attributable to the fact that in military laboratories the ideal aimed at, and successfully attained, is the isolation of the causal organism; whereas the private practitioner has fewer facilities for the attainment of this ideal and his diagnoses are mainly made on serological grounds.

It will further be noted that the supply of concentrated agglutinable suspensions, which comprise the 'O' antigens, to the civil has shown a marked increase, indicating that the value of the 'O' agglutination test is beginning to be appreciated.

Small demands for Vi antigen have also been received from civil sources. When these suspensions are issued, complete details of the tech nique of the test, and interpretation of the results are also forwarded.

Laboratory tests in connection with the diagnosis of syphilis.—The number of Wassermann tests carried out in the four laboratories (Quetta, Poona, Rawalpindi and Meerut) engaged in this work numbered 24,080, and the number of Kahn tests 20,302. These figures for Quetta are 5,412 more than last year, and for Meerut show an increase of 6,467.

The percentage of hæmolysed or septic sera, and broken capsules received in the above laboratories was 1·8, which is a satisfactory figure, and tends to show that great care must have been taken by hospitals in the taking and despatch of specimens for examination. Officers Commanding laboratories have realised the importance of the Kahn test as a check on the Wassermann test as is shown by the greatly increased number of these tests which has been undertaken.

The work done in the four laboratories and results obtained are shown in Tables 105 and 106.

TABLE 105.

Wassermann and Kahn Tests 1940.

	Total Wasserman test carried out.		Total Wassermann tests carried out on blood from all sources.	Total Wassermann test on C.S. Fluid.	Total Kahn tests.	Percentage of Sera haemolysed and septic.		Percentage of capsules arrived broken.	
	British Troops.	Indian Troops.				British Troops.	Indian Troops.	British Troops.	Indian Troops.
Southern Command Laboratory, Poona ..	1,463	5,589	8,693	64	8,576	7·58	5·83	1·09	0·69
District Laboratory, Rawalpindi	1,634	5,792	7,602	96	4,213	0·24	0·95	1·38	1·14
District Laboratory, Meerut ..	2,218	3,268	5,798	58	5,764	2·8	2·3	0·6	0·8
District Laboratory, Quetta ..	498	1,226	1,987	25	1,749	1·38	1·60	0·39	0·80
Total ..	5,813	15,875	24,080	239	20,302	..	..	..	..

TABLE 106.

Results of Wassermann Tests—1940.

	Poona.		Rawalpindi.		Meerut.		Quetta.	
	Negative.	Positive.	Negative.	Positive.	Negative.	Positive.	Negative.	Positive.
Syphilis primary (before treatment) ..	82	1,817	23	74	20	360	..	4
Syphilis secondary ..	..	219	..	16	..	71	..	20
Syphilis tertiary ..	..	279	..	23	..	54	..	7
Syphilis congenital ..	5	13	..	..	..	..	..	..
Syphilis after treatment	2,876*	347	2,032	633	1,136	..	543	82
Gonorrhoea ..	21	..	48	4	39	..	26	5

*In view of the transfer of units to other Commands and overseas it is not possible to give accurate figures ; furthermore, some of the cases are still undergoing treatment.

The number of cases diagnosed primary syphilis on a positive Wassermann reaction is still considered to be too high, but a great improvement has taken place since last year. With Indian troops, it is felt that many report late for examination, having previously obtained local treatment in the bazaar. For hospitals situated in a station where no laboratory facilities exist, the practice is still continued of forwarding specimens of sera (taken from the sore), in capillary tubes to the nearest laboratory for examination. A total of 435 specimens of this nature was forwarded to laboratories and positive results obtained on 97 occasions.

The following tables show the method by which primary infections in the case of British and Indian troops were diagnosed throughout the year by Commands.

TABLE 107.

Commands.	Number cases of syphilis fresh admitted to hospitals.	Number of cases of syphilis fresh diagnosed. By demonstration of T. pallida.	On positive Wassermann reaction.	By demonstration of T. pallida and on positive Wassermann reaction.
British Troops.				
Northern Command ..	83	35	44	4
Western (I.) District	15	11	4	..
Eastern Command	121	41	56	11
Southern Command ..	151	76	45	29
All India	370	163	149	44

TABLE 108.

Commands.	Number of cases of syphilis fresh admitted to hospital.	Number of cases of syphilis fresh diagnosed. By demonstration of T. pallida.	On positive Wassermann reaction.	By demonstration T. pallida and on positive Wassermann reaction.
Indian Troops.				
Northern Command ..	186	35	136	15
Western (I.) District ..	54	3	44	7
Eastern Command	172	34	124	13
Southern Command	415	111	270	30
All India	827	183	574	65

Notes on routine laboratory work.—Biochemical work showed a definite increase over 1939, *e.g.*, blood sugar estimations rose from 336 to 378, and blood urea, from 345 to 433. There is little doubt that the increase in the number of examinations of this nature is due to the fact that clinicians are now fully alive to the help which tests of this nature afford them in the diagnosis of their cases and in the line of treatment to be adopted.

Bacteriological examinations of water numbered 2,593 which is an increase of 220 over last year. For this test all laboratories now employ the method recommended in the Ministry of Health Bulletin No. 71. Chemical examination of specimens of water numbered 564, as against 197 carried out in 1939. Bacteriological examinations of specimens of milk numbered 576 which is an increase of 174 when compared with last year.

A total of 11,844 specimens of urine was culturally examined, which included 1,243 examinations carried out in the Enteric Laboratory, Kasauli, in the investigation of convalescent patients who had suffered from infection with the enteric group. From the total number of sepcimens examined in all laboratories B. coli was isolated on 473 occasions.

Scrapings from cases suspected of suffering from tropical sore numbered 469 as compared with 523 last year. Leishman-donovan bodies were demonstrated on 102 occasions, the District Laboratory, Quetta, being responsible for only 54 cases this year as compared with 90 last year. The officer-in-charge of this Laboratory now reports the second case which has occurred in five years, in which the sore appeared on the face of an adult female. Both cases now reported used powder and cosmetics sparingly or not at all.

Tissues sectioned and reported on numbered 663 which included a large number of reports on tumours. In addition a total of 93 sections were prepared from the brains of animals suspected of having died from rabies. Negri bodies were demonstrated on 32 occasions. The amount of section work completed depended largely on the interest taken by the officer-in-charge of the laboratory. Many examinations were without doubt carried out for instructional purposes only.

During the year 8 medical officers, 7 assistant surgeons (British cadre) and 5 assistant surgeons (Indian cadre) were trained in laboratory duties, and in addition 12 assistant surgeons (British cadre) and 52 assistant surgeons (Indian cadre) were trained in clinical side room work. Training of this nature is essential in order to have a reserve of trained personnel for laboratory duties, and also to ensure that as many as possible are competent to undertake the duties relevant to a clinical side room. Owing to the war difficulty was experienced in some hospitals in sparing personnel for this training, but the numbers actually trained compare very favourably with last year.

Enlarged Clinical Side Rooms.—The enlarged clinical side rooms established at Jhelum, Wana and Wellington have again this year thoroughly justified their existence. In Jhelum, during the year, 4,294 tests were completed. The work covered a wide field, and included the cultivation of fæces for dysentery and enteric group organisms, bacteriological examination of water, and simple biochemical examinations, as well as the usual work of a clinical side room.

In Wana over 4,000 specimens were examined and the work carried out reached a high standard. A bacteriological report can now be rendered to the wards of this hospital in a matter of hours, whereas formerly owing to difficulty of communication in Waziristan, it took days for specimen to travel to Razmak and for the report to return to Wana.

In Wellington a total of 1,717 examinations were carried out, which included all routine examinations normally entrusted to a District or Brigade Laboratory. In the case of dysentery specimens showing a typical bacillary exudate, causative organisms were isolated in 73·6% of cases. This result compares very favourably with results obtained in many of the large military laboratories.

Library.—The Medical Directorate's technical library has again been extensively used by many medical officers throughout India, a total of 170 reference books having been issued on loan and 52 new volumes purchased.

Liaison between laboratories and hospitals.—In all stations a close liaison has been maintained between the pathologist in his laboratory and the medical officer in charge of cases in the wards. In many stations this liaison has been encouraged by lectures and demonstrations given by the officer in charge of laboratories to newly joined officers. It is the recognised custom now in all military laboratories in India for the officer in charge to visit the wards in the hospital daily, see the cases himself from whom he receives specimens and discuss them with the medical officer concerned.

This close liaison is essential for efficiency, and undoubtedly explains why results obtained throughout the year have been so satisfactory.

66. Medicine.

In spite of the great expansion which has taken place in the Army in India, no abnormal qualitative change was noted during 1940 in medical diseases among soldiers. Reports from all Districts show that malaria and dysentery produced no clinical abnormalities, that the tropical variety of typhus ran its

usual mild course and that pulmonary tuberculosis was within normal limits. Sporadic cases of catarrhal jaundice, especially among young officers, continued to occur; the evidence in favour of this condition being an infective hepatitis is strong.

Malaria.—This disease, being the commonest medical condition in India, naturally receives considerable therapeutic attention. Up to 1940 the standard course of treatment was:—

British troops—		
Atebrin .	.0·3 grammes daily for 7 days.	Interval of three days.
Plasmoquine .	.0·03 grammes daily for 5 days.	
Indian troops—		
Atebrin .	.0·3 grammes daily for 7 days.	Interval of three days.
Plasmoquine .	.0·2 grammes daily for 5 days.	

A permissible variation of this standard treatment was the administration of 10 grains of quinine thrice daily for two days before beginning tebrin. This is considered by most physicians to control the fever more quickly than atebrin alone.

The standard treatment has given admirable results over a number of years, and it is considered that the steady decline in the relapse rate is due to the adoption of this method of treatment by modern drugs. This contention has already been discussed in paragraph 64. During 1940, however, owing to the urgent need to conserve atebrin, these standard courses had to be altered, quinine displacing atebrin in the treatment of most cases of malaria. Such treatment, carefully controlled and standardised, appeared to give results during 1940 little, if any, inferior to those obtained in former years by atebrin. Quinacrine was employed as a substitute for atebrin and appeared to give equally good results, but sufficient stocks were not available for any final general conclusion to be drawn regarding its efficiency.

Dysentery.—Kurchi bismuth iodide was employed as a substitute for emetine bismuth iodide in the treatment of amœbiasis in some stations; and appeared to produce very good results. Its use, however, was not on a large enough scale to justify the drawing of any firm conclusion.

Sandfly fever.—This disease, which is the cause of so much hospitalization of British troops during the early summer in the Northern Command ran true to type in 1940. The average duration of fever was three to four days and the average stay in hospital eight to nine days. It is generally agreed that our diagnosis of sandfly fever is far from accurate and it is probably that many other diseases—dengue, influenza, fever of uncertain origin, etc.,—are often included within the term " sandfly fever ".

Anterior poliomyelitis.—An efficient organisation for the treatment of respiratory paralysis in " iron lungs " now exists in military hospitals in India. Several of the Drinker pattern apparatus, some made in military arsenals in India and some imported from England, are available. These are distributed to various important hospitals (one to each hospital). Cases are brought to these centres by train, motor ambulance or aeroplane in small portable hand-operated " iron lungs " which are distributed over subsidiary centres throughout India. These portable " iron lungs " were made in Rawalpindi Arsenal.

Pulmonary tuberculosis.—The treatment of pulmonary tuberculosis by collapse therapy has demonstrated the need for further surgical assistance, thorascopy and means of dividing intra-thoracic adhesions.

Epilepsy.—Dilantin was employed in the treatment of epilepsy with apparently good results, but to too limited an extent to justify any general conclusion.

Phlebitis.—The very expensive drug heparin has been used on a few cases of phlebitis with good results.

Sprue.—Nicotinic acid was employed in an endeavour to counteract the deficiency of vitamin B of sprue. The results were promising; and it is certainly a logical procedure.

The sulphonamide group of drugs.—All cases of pneumonia, cerebro-spinal fever and gonorrhœa are now treated as a routine with members of this group of drugs in military hospitals in India. All Officers Commanding these hospitals are unanimous in testifying to the efficiency of such treatment. The results obtained in the treatment of the outbreaks of cerebro-spinal fever referred to in paragraph 45 were so outstanding as to reduce the severity of this disease to or below that of influenza.

67. Surgery.

The operations performed during 1940 covered a wide field and illustrate the scope which is available for the practice of surgery in the Army in India. Practically the only ommissions from the whole field of surgery are operations for the radical treatment of carcinoma which are seldom undertaken in military practice.

TABLE 109.

Surgical Operations—1940.

Operations—	Total Number.	Re-covered.	Invalided.	Died.	Remarks.
King's Commissioned Officers (British Service).					
Fractures, bones and joints	36	36	..	..	
Diseases of digestive system	37	36	1	..	
Ear, nose, throat and eye	46	46	..	..	
Skin and subcutaneous tissues	58	58	..	..	
Genito urinary tract	24	23	..	1	Death due to anaesthetics.
G. S. Wounds	3	2	..	1	
Blood vessels	1	1	..	..	
King's Commissioned Officers (Indian Service).					
Fractures, bones and joints	32	31	..	1	
Diseases of digestive system	33	33	..	..	
Ear, nose, throat and eye	3	3	..	..	
Skin and subcutaneous tissue	40	40	..	..	
Genito urinary tract	3	3	..	..	
G. S. Wounds	1	1	..	..	
Blood vessels	5	5	..	..	

Surgical Operations—1940—contd.

	Total Number.	Re-covered.	Invalided.	Died.	Remarks.
British Women and Childr n.					
Fractures, bones and joints	55	55	..	..	
Diseases of digestive system	66	63	..	3	
Ear, nose throat and eye	168	168	..	..	
Skin and subcutaneous tissues	53	53	..	..	
Genito urinary tract	138	138	..	..	
Blood transfusions	5	5	..	..	
Diseases of the breast	5	5	..	..	
Warrant Officers, Non-Commissioned Officers and Men of the British Army.					
Fractures, bones and joints	406	405	1	..	
Diseases of digestive system	338	335	..	3	
Ear, nose, throat and eye	221	221	..	..	
Skin and subcutaneous tissue	695	695	..	..	
Genito urinary tract	149	149		..	
G. S. Wounds	50	42	6	2	
Blood vessels	24	23	..	1	
All other (R. N., R. S. F., T. A., Civilians).					
Fractures, bones and joints	72	72	..	—	
Diseases of digestive system	64	63	..	1	
Ear, nose, throat and eye	216	216	—	—	
Skin and subcutaneous tissue	101	101	..	..	
Genito urinary tract	35	35	..	—	
Blood transfusions	2	2	..	..	
Indian Other Ranks.					
Fractures, bones and joints	552	551	..	1	
Diseases of digestive system	413	406	..	7	
Ear, nose, throat and eye	130	130	..	..	
Skin and subcutaneous tissue	838	838	..	..	
Genito urinary tract	127	127	..	..	
G. S. Wounds	43	39	..	4	
Blood vessels	11	11	..	..	
Non-Combatants (enrolled).					
Fractures, bones and joints	147	147	..	..	
Diseases of digestive system	88	87	..	1	
Ear, nose, throat and eye	45	45	..	..	
Skin and subcutaneous tissue	413	413	..	..	
Genito urinary tract	40	40	..	..	
G. S. Wounds	10	8	..	2	

Fractures.—Fractures naturally constitute a large proportion of military surgical cases. Not only have fractures been as numerous as ever among the garrison in India, but a certain number have already arrived in India from overseas war areas. Special fracture clinics have been established in central military hospitals, and have functioned well during 1940. The scale of equipment for these centres has been carefully worked out and is generous. Portable X-Ray sets are gradually becoming available and are of the greatest value. Unfortunately, the demand still exceeds the supply.

The value of skeletal traction by pins and the use of Bohler's unpadded plaster fixation and traction using Bohler's special series of metal frames is specially mentioned by several surgeons.

Gun shot wounds.—The main incidence of these is in Waziristan where conditions of semi-active service are constantly in force. Experience in the treatment of such cases at the large military hospitals at Razmak, Bannu, and Wana is considerable, for peace time practice. Many of the cases, having been transported under fire from mountain tops and conveyed long distances over mountain roads, arrive at hospitals suffering from advanced surgical shock. Although this naturally weighs the balance against recovery, the results obtained during 1940 have been highly satisfactory. The methods of Winnett Orr, so strongly and ably championed by Trueta, have been extensively used and favourably reported upon. The sulphonamide group of drugs have become deservedly popular both as a prophylactic and as a therapeutic agent in combating subsequent infection with streptococci and gas-forming organisms.

Vericose veins.—Doubt is expressed by some surgeons regarding the efficiency of sclerosing solution used alone. Much more favourable and lasting results are reported from treatment by ligature and injection combined, which is in accordance with the reports in current literature. It is probable that better results are frequently obtained by excision alone, as it is not unusual to have to excise large painful thromboses as the result of injection. The pendulum has tended to swing back to operation, reserving injection for selected cases.

Cases of special interest.—For reasons of space it is not possible to do more than indicate a few of the very large number of interesting cases which occurred in 1940.

Perhaps the most remarkable to occur was bilateral moist gangrene of both legs which complicated a case of severe haemorrhagic chicken-pox in an Indian child at Kohat. Double disarticulation at the knee joint resulted in recovery. From Quetta, a good result is reported following the removal of a parathyroid tumour in a typical case of hyperparathyroidism.

In Peshawar, the nowadays rare operation of ligature of the third part of subclavian artery was successfully performed to deal with recurrent secondary haemorrhage complicating an infected gun-shot wound of the humerus.

For Razmak a fatal case of pancreatitis in a sepoy is reported.

Accommodation.—An air-conditioning plant was installed in the British Military Hospital at Lahore in 1940. It is the policy to install such plants in all the large hospitals in India eventually. Unfortunately their cost has soared

owing to the war ; and a halt for the present has had to be called in the execution of this policy. An air-conditioned operating theatre makes surgery reasonably safe even in the hottest Indian summer instead of the arduous, formidable and exhausting procedure if now is.

68. Radiology.

The following table gives a summary of X-ray examinations performed during 1940.

TABLE 110.

No. of patients treated—		
British		13,427
Indian		14,924
Civilians		1,876
No. and nature of examinations—		
Bones and Joints	Injury	16,461
	Diseases	3,347
Sinuses		929
Teeth		1,094
Lungs		5,167
Heart		272
Gastro-intestinal		609
Liverg-all bladder		3,331
Urinary tract		1,123
Genital tract		169
Foreign body		80
Pregnancy		58
Miscellaneous		501
Cases in which contrast media, etc., was used—		
Barium		666
Shadacol		154
Uroselectan B.		128
Perabrodil		1
Lipiodol		13
Ariodol		18
Miscellaneous information—		
No. of films used		38,400
No. of dental films		3,505
No. of exposures		58,508
No. of X-Ray papers.		2,302
No. of screen examinations		858

69. Oto-rhino-laryngology.

There was a considerable decrease during 1940 in mastoid operations. This is attributed to better conservative treatment and to the early use of drugs of the sulphonamide group. On the other hand, there was an increase in operations for tonsillectomy among British other ranks. Tonsillitis is always much more common among Europeans than Indian.

Equipment, generally speaking, has been satisfactory.

Northern Command.—The operation facilities in Murree have been proved by the installation of a new hot water supply, including new basins and skins in the operating theatre block. The total attendance for treatment were 5,130, an increase of 670 over 1939. Include in this total are 1,529 new cases, an increase of 323 compared to 1939. There were 438 operations with no deaths during 1940. A case was reported of a foreign body (aspicule of bone) which had lodged in the larynx of a child aged 5 years. All efforts to remove it failed, and operation was impossible. One month later the child recovered her voice and appeared normal in every way.

Southern Command.—The total operations performed in 1940 were less than in 1939. This is attributed to the increased movement of troops due to the war. Most operations were performed under local anaesthesia, pantocaine or cocaine being employed. Two cases of nasal polypus due to Rhino sporidium seeberi were reported. There have apparently only been thirty cases reported previously.

Eastern Command.—The equipment has been improved by the addition of two infra-red lamps, a diathermy apparatus and a cold quartz ultra-violet lamp with local applicator. This latter lamp has been found most useful in treating cases of sinusitis and rhinitis. One death occurred during the year from syncope under anaesthesia before operation was begun.

Western Independent District.—Work increased during 1940 due to expansion of the Army and the recall to colour service of reservists, many of whom suffer from chronic otitis. A case of calsification and ossification of the auricle in a British soldier occurred, which was successfully operated upon. No deaths occurred during 1940. Investigations were undertaken to find a suitable obturator for protecting the ear drum from excessive noise during artillery fire. Dental cotton wool and cigarette filter tips hold out possibilities.

70. Ophthalmology.

During 1940, mainly owing to the recent free issue of a second pair of Mark III spectacles to British other ranks and of one pair to Indian other ranks, the number of patients seen in our ophthalimic centres has increased greatly over former years. Next to errors in refraction, the bulk of patients during 1940 have been cases of conjunctivitis, especially among Indians. Pterygium is still fairly common. Trachoma is uncommon among Gurkhas and Bengalis but very common among other races, particularly in the North of India. Sulphanilamide was tried in Poona and found to give a measure of relief from the irritation caused by trachoma while in Meerut a great measure of success is claimed in the treatment of this disease by the following method :—

(*a*) Sulphanilamide 0·01 gram per kilogram of body weight given each day in 4 doses for 21 days.

(*b*) Sodium bicarbonate 7 grains twice daily.

(*c*) Antimony potassium tartrate 2 per cent. ointment massaged into the lids twice daily.

In Quetta a soldier had his detached retina restored by diathermy. A cadet officer, complaining of scotoma, was found to have positive Wassermann and Kahn reactions. Under appropriate anti-syphilitic treatment, his vision improved. Two cases of macular degeneration in ratings of the Royal Indian Navy and a case of double optic neuritis are reported from Bombay.

From Meerut is reported a case of diplopia due to optic neuritis in an officer the result of continued use of carboresone. From this District is also reported a case of pituitary tumour clinically detected by the present of hemianopsia and an abnormal fundus, and later confirmed by radiological examination.

Malingering.—Owing to the war, malingering has naturally become somewhat more common than in time of peace. The following are the main types of the diseases simulated :—

(*a*) *Conjunctivitis.*—Self-inflicted. Usually monocular but not necessarily restricted to the lower fornix. Cultures were found to be sterile and patients after having their eyes irrigated were given extra duty. This usually brought the " disease " under control.

(*b*) *Night blindness.*—A few genuine cases of keratomalacia in undernourished recruits are found from time to time, but such are relatively rare. Night blindness is simulated more frequently than any other eye condition, particularly by mechanical transport reservists. In one District all cases reporting with " night blindness " were given extra duties by day and no duty at night. This resulted in the complete cessation of malingering in this District from this cause.

(*c*) *Visual defects.*—The simulation of greatly impaired vision, *e.g.*, hand movements upto 1/60 in one eye, usually the right, are common. Although such malingerers are easily detected, the need for careful examination is shown by the case of a recruit with two months service who was found to have 17 degrees of myopia in both eyes. The cunning malingering is he who pretends to a moderate defect, *e.g.*, 6/60—6/36 in both eyes. Such cases give the examining opthalmologist much more trouble than the malingerer who pretends to almost total loss of vision.

71. Anaesthetics.

The number of anaesthetics administered during 1940 is given in table 110 and shows a decrease of 410 compared to 1939. Included in the total figure are three deaths under anaesthetics, giving a mortality rate of approximately 0·103 per cent. Nitrous oxide-oxygen-ether has not been so extensively used, except in Rawalpindi and Murree, as in 1939. Chloroform and ether by the open method has been extensively used in Waziristan District, where it is the stock method for general anaesthesia. The specialist in anaesthesia Western (Independent) District has found Shipway's apparatus of great service especially for ear, nose and throat, eye and dental operations. The figures for spinal anaesthesia are also less than last year. Percaine 1/1500 hypobaric solution has been the drug most employed. At Peshawar the drug is injected

with the patient in the ventral position supported by pillows so that the mid-dorsal region of the spine is the highest point in the canal (Lake's method). Good results with a decrease in the amount of anaesthetic solution required are claimed for this method. Sodium evipan has been much less employed in the previous years which is possibly due to increasing difficulty in obtaining the drug. Vinesthene has been used with success in thirteen cases in Rawalpindi and Murree. Complete success in the reduction of fractures with local anaesthesia is claimed from Waziristan District, where the drug used was 2 per cent. novocaine.

The danger of unskilled anaesthesia and the need for training in this subject have been fully realised in all Districts; and special training has been given to selected officers and members of I. M. D., throughout 1940. Three deaths under anaesthesia have been reported. One death occurred under spinal and two under general anaesthesia. The comparative freedom from port-operative complications, such as respiratory affections and vomiting, have been commented on from Rawalpindi and Western (Ind.) District. A few cases of headache following spinal anaesthesia have been reported from Peshawar. These however were not severe and cleared up rapidly.

TABLE 111.

Anaesthetics 1940.

Anaesthetics.	Number.
N20	474
N20-02	127
N20-02-other	308
N20-02-evipan	1
N20-02-local	2
Chloroform	194
Chloroform and other (open)	793
Cloroform and other (Shipway's)	58
Ether	214
Ethyl chloride	39
Local infiltrations and surface applications	484
Spinal blocks (Percaine)	129
Spinal blocks (Stovaine)	28
Evipan	13
Pentothal sodium	3
Divinyl ether (Vinesthene)	13
Avertin	7
Sacral block	4
Total	2891

72. Dermatology.

(*a*) *Skin diseases.*—Fungoid infections, classified as tinea, were once again the most common among diseases of the skin during 1940. A case of widespread impetiginised eczematous dermatitis came under treatment during the year. The condition was at first thought to be due to sensitisation, but " patch testing " was negative. When the more acute symptoms subsided,

the true cause, scabies, became apparent. This case well illustrates the advisability of looking first for the more simple cause of any pathological condition. The benzyl-benzoate and soap method of treating scabies was introduced during the year, but was not in use long enough to permit of any opinion being given on its efficacy. At one station the treatment of scabies by a paint consisting of alcoholic extract of pyrethrum was tried, but was found to be ineffective.

An unusual reaction to vaccination was reported during 1940. A civilian, an oil driller by trade, developed a generalised vaccinia which continued as an eczematous dermatitis amounting almost to an exfoliative dermatitis. "Patch testing" showed that he was not "trade sensitive" but that he was highly sensitive to calf lymph. Attempts to desensitise him, commencing with 0·1 cubic centimetre of a 1/1,000,000 dilution of calf lymph in normal saline, produced a very severe reaction and had to be discontinued. He eventually responded to inoculation with urinary proteose prepared from his own urine.

(*b*) *Venereal diseases.*—The outstanding feature in the treatment of venereal diseases during the last few years has been the revolution in the results obtained in the treatment of gonorrhoea by drugs of the sulphonamide group, in particular M. & B. 693. Routine methods of treatment have now been adopted in military hospitals, the principle being to develop a high concentration of the drug in the body as soon as possible but to stop short of the production of toxic symptoms. Local treatment has been relegated to a minor place, where not entirely discarded; and the attempt to favour the development of immunity by withholding drug treatment for a week has been abandoned. The results of these new lines of treatment have been outstanding, the average length of stay of a patient in hospital having been reduced from sixty days or more to eighteen or less. Gonococci vanish from the urethral discharge in two to three days; and the discharge itself disappears in four to six days. The absence of complications and relapses is one of the most notable results of this treatment.

As a result of the wide publicity given to these drugs and the case with which they can be obtained in the bazzars, it is probable that many British soldiers are now resorting to self treatment of gonorrhoea. The following facts appear to point to this conclusion:—

(*a*) The drop in the ratio of the incidence of gonorrhoea to syphilis from approximately 4 to 1 in 1933 to 5 to 2 in 1940 (*vide* table 37).

(*b*) The increase in the incidence of urethritis in which no gonococci are found.

(*c*) The increase in the incidence of resistant cases of gonorrhoea. A sailor, treated in a military hospital in 1940, who was particularly resistant admitted having taken one tablet of M. & B. 693 thrice a day while at sea.

(*d*) The occasionally positive results of the paradimethylaminobenzaldehyde urine test in patients reporting sick with gonorrhoea.

This habit of self treatment not only interferes with subsequent scientific treatment in hospital but is actually dangerous. During 1940 a fatal case of agranulocytosis occurred in a soldier who had been taking full doses of M. & B. 693 before reporting sick but who denied this when questioned before treatment in hospital was begun. The urine test by paradimethylaminobenzaldehyde has done something to prevent such fatalities. Its weak point is, however, that positive results are not usually obtained if administration of the drug has been discontinued for three days. Great stress is laid in military hospitals in India on the importance of frequent blood examination by total while cell counts and differential counts before and during treatment of all cases of gonorrhoea by the sulphonamide group of drugs.

Early in 1940, a trial was made of a method of preventing gonorrhoea and soft chancre by means of the prophylactic administration of M. & B. 693. Unfortunately, owing to the need for conserving the drug on account of the war, this had to be discontinued before enough data had been obtained to enable a conclusion to be drawn. This was unfortunate as, although this method of prophylaxis has been mooted, it is believed that it had not before been tried on a large scale.

Courses of treatment for syphilis among troops have now been brought into line with the standard methods adopted in military hospitals in the United Kingdom. The same standard methods, slightly modified, were brought into force for Indian troops during 1940. These methods have given excellent results during the year.

Seven cases of toxic reactions following administration of organic arsenical preparations were reported during 1940, six being exfoliative dermatitis which recovered and one haemorrhagic encephalitis which proved fatal.

73. Mental diseases.

Statistics for 1940 show that there has been no increase in admissions for mental disorders due to war conditions. From all Commands, however there have been reports of a slight increase of hysteria among recruits and reservists. The former are probably suffering from familial traits, the latter from the under nourished state in which many of them report for duty.

In time of peace, British mental patients are invalided to the United Kingdom within a relatively short time of being diagnosed. Owing to the war, much delay now results and British mental patients tend to accumulate in India to a considerable extent. This has caused some little administrative embarrassment; and, to deal with the matter, a forty-bedded mental hospital is to be built at Poona. The ordinary Indian mental case is invalided out of the service as soon as diagnosed, and either handed over to his relatives or admitted to a civil mental institution. So that, normally, there is no need for elaborate accommodation for Indian mental patients. During the war, however, cases arriving from overseas have taxed the facilities of the hospitals which receive these cases on their disembarkation in India and which hold them pending distribution to hospitals near their depot stations.

Northern Command.—During 1940, 36 British and 94 Indians were treated. Four British officers and 6 British other ranks benefited by psychotherapy

and were able to return to their duties. Cardiazol and fever therapy were administered to suitable cases with good results. Forty seven cases of hysteria, mainly Indians, were treated; of these 14 were able to return to duty, the remainder being invalided out of the service. Three cases of atebrin mania occurred, all of which recovered within a short time.

Southern Command.—Eighty-five British and 32 Indian cases were treated during 1940. One Indian patient was diagnosed cannabis indica psychosis. This is a common psychosis in civil mental hospitals in India but is very rare in military practice.

Eastern Command.—Thirty British and 22 Indian cases were treated during the year.

Western Independent District.—During the year 1940, there were very few cases of mental disease or suspected mental disease amongst British troops. There were 6 cases diagnosed as hysteria among Indian troops. Of these, four appeared to have reasonable grounds for their condition and, improving under treatment, returned to their duties. One case of anxiety neurosis was boarded out of the service. One of his fears was that he could see no reason why when he fired his rifle the bullet would necessarily go forward. He said it might just as well go backwards, in which case it would get him. He had an enlargement of the thyroid gland, but no signs of exophthalmos. Arrangements have been made to reserve special blocks for treatment of mental cases in the newly built extension wings of the B. G. H. and I. G. H., Karachi.

74. Rabies and anti-rabic treatment.

There were two cases of rabies, both Indians, during 1940.

Anti-rabic treatment has been administered widely during the year. There are now treatment centres established in 58 military stations and vaccine can be sent if need be, from any of these centres to outlying hospitals.

The following summary shows by Districts the number of anti-rabic courses of treatment carried out during 1940.

TABLE 112.

Districts.	British.	Indian.	Total.
Peshawar	70	64	134
Rawalpindi	128	98	226
Kohat	17	21	38
Lahore	189	109	298
Waziristan	47	45	92
P. & A.	61	18	79
Meerut	161	100	261
Lucknow	164	51	215
Deccan	80	38	118
Jubbulpore Bde. Area	49	15	64
Bombay	43	10	53
Madras	40	19	69
Western (Ind.)	32	17	49
Total	1,091	605	1,696

75. Dental conditions and treatment.

Figures relating to dental treatment are given in the following table :—

TABLE 113.

Category.	Teeth Extracted.	Teeth conserved. Without root treatment.	Teeth conserved. With root treatment.	Scalings completed.	Gingivitis or stomatitis treatments completed.	Supplied with new dentures.	Dentures supplied.	Dentures remodelled.	Dentures repaired.
British—									
Other Ranks ..	11,549	32,246	79	5,326	319	414	601	312	264
Officers	18	24	1	4	2	..	..	..	..
Women	1,182	1,517	6	169	47	16	26	3	1
Children	1,288	914	..	9	9	..	..	..	..
Royal Air Force—									
Other Ranks ..	281	1,137	5	104	15	13	20	16	6
Officers	14	82	..	7	5	..	..	..	..
Women and Children	69	117	1	3	..	1	1	..	..
Indian Ranks.. ..	263	26	..	5	7	13	16	..	3
Naval Ratings ..	6	5	..	..	1	..	..	..	..
Dominion Forces ..	15	15	..	1	4	..	..	..	..
Prisoners of War ..	161	115	4	9	52	..	..	..	1
Civilian Internees ..	254	637	112	161	152	11	18	..	..
Total ..	15,100	36,835	208	5,798	613	468	682	331	275

The total number of attendances for treatment for all categories was 37,821.

The dental condition of troops drafted from the United Kingdom during the year was indifferent, few having received any dental treatment before departure. Particular care was therefore exercised by dental officers in India to obtain the attendance of as many of these men as practicable. Altogether, for British other ranks there were 28,837 attendances for treatment and the total number of teeth conserved for them was 32,325. They were also supplied with 601 new dentures and the total number of dentures renewed and repaired was 576. There were at the end of the year 5,274 British other ranks awaiting dental treatment, of which 192 required new dentures. As in former years,

there has been little evidence to suggest that climate, water or the army ration has had any influence on diseases of the teeth and gums. A few cases of Vincent's infection were reported among troops who had been drafted to India from the United Kingdom and who had not received any dental treatment before departure.

It was found that there was a need in war to provide a dental service for Indian troops in order to prevent sick wastage and invaliding on account of dental desease. It was therefore decided, with the concurrence of the Secretary of State for India, to establish a Dental branch of the Indian Medical Service for Indian qualified dental surgeons, as a war measure. Twelve appointments to the military cadre of this branch were sanctioned initially. The terms and conditions of appointment are similar to emergency Indian commissioned officers appointed to the medical branch except that candidates are required to have a suitable dental qualification. No actual appointments were made during 1940, although preliminaries took place with a view to appointments being made early in 1941.

As in the past, treatment was also afforded to personnel of the Royal Air Force in equal measure to those of the British Army ; and, in cases of urgency, to other ranks of the Indian Army and Indian Air Force, to families of British soldiers and airmen, to naval ratings and in special circumstances to officers and to members of the military nursing services.

76. Women and children.

A. *Disease and treatment. Families Hospitals (British).*

(*i*) *Hospitals, staffs and equipment.*—The work in British families hospitals tends to show an all round increase. This is accounted for by the larger number of entitled families now in India due to the War. This increase has been noted specially in officers' families.

In spite of the war, improvements and alterations to these hospitals have continued. Peshawar families hospital has recently been equipped with a new hot water system. Minor alterations such as fly-proofing of certain wards in the Murree hospital have been approved. Quetta families hospital has been equipped with air conditioning in the labour ward and operating theatre.

The standards laid down for instruments are not yet adequate for families hospitals, which are really separate surgical units. Most have increased their equipment from private funds. The Minnitt's gas and air apparatus is being used with success in many hospitals and it is hoped that in the near future all families hospitals will be supplied with this valuable asset to maternity work.

(*ii*) *Maternity and gynaecological uses.*—As in previous years maternity cases have formed a large part of the work of families hospitals. The success of this work is shown by the fact that only one maternity case, complicated by myocarditis, died in the eight family hospitals during the year 1940. This fact supports the view that all ante-natal cases should be sent to centres where a family hospital exists.

Ante-natal attendances have been large and satisfactory at all centres. The frequency of anaemia in ante-natal cases is put as high as 35 per cent. by one observer. Post-natal clinics are also held at most centres.

Gynaecological cases form a much smaller item of the work. All types of cases are dealt with but the larger proportion of the operations for the year were of a minor character.

(*iii*) *Principal diseases.*—Malaria. Compared to 1939 there has been an increase from 21·3 to 33·4 in admissions to hospital per 1,000 women for malaria and an increase from 19·9 to 25·5 for children.

Tuberculosis.—The incidence of tuberculosis among women and children is maintaining its low level.

TABLE 114.

Tuberculosis amongst women and children of the British Army in India.

	Actuals			
	Pulmonary tuberculosis.		Non-pulmonary tuberculosis.	
	Women.	Children.	Women.	Children.
1920	16	..	..	1
1921	11	2	..	..
1922	12	2	..	..
1923	4	1	..	2
1924	8	1	1	..
1925	13	4	1	..
1926	17	1	..	1
1927	5	2	..	..
1928	8	2	..	..
1929	9	..	..	8
1930	10	..	..	..
1931	14	3	..	4
1932	5	1	..	4
1933	6	1	2	1
1934	6	3	1	3
1935	3	..	3	3
1936	6	2	2	2
1937	6	1	..	2
1938	8	1	1	6
1939	1	1	..	8
1940	2	..	..	6

The Dysentery-diarrhoea group, as in former years, is the largest single cause of mortality among British children in India. In older children, death is due usually to toxicity; but in infants death is practically always the result of dehydration. The need for the early admission of these cases to hospital cannot be stressed too much.

The infrequency of amoebic dysentery in infants is worthy of note; and the use of emetine in infants cannot be too strongly deprecated, except in cases proved in the laboratory to be amoebic.

Infectious diseases.—No large outbreak of infectious diseases has been noted in any station.

Diphtheria.—This has provided the largest number of cases of infectious diseases among women and children. Except at Dalhousie, which had nine cases (8 children and 1 women) in December, the cases were isolated and sporadic.

Enteric group of fevers provided the next largest number of cases of infectious diseases. All were isolated cases occurring in different stations.

Measles.—Twenty six cases occurred in Dalhousie following the arrival of children from the United Kingdom in April 1940. Apart from a mild epidemic of 10 cases in Quetta, no other outbreaks of measles occurred.

(*iv*) *Items of interest.*—Two hospitals reported the birth of premature twins, the weight of one pair being 4 lbs. and 3 lbs. 10 ozs. and the other 3 lbs. 2 ozs. and 2 lbs. 15 ozs. All four babies survived.

A patient aged 39, who had been nine years married and had previously had four miscarriages, successfully produced a living child which is doing well. During pregnancy she was kept in bed till the fifth month. She had vitamin E capsules throughout pregnancy.

A case of rigidity of the cervix is recorded where the cervix was only one finger dilated after four days labour. The case was treated by bi-lateral incisions of the cervix which resulted in full dilatation one hour later and permitted of a forceps delivery. Mother and child both did well.

A case of pelvic tumour obstructing twin birth is noted. The twins were both delivered successfully by forceps past the obstructing tumour which was about the size of a grapefruit.

A case of typoid in a British child of 21 months is recorded. The attack was moderately severe but complete recovery occurred.

One unusual case of liver fluke causing a subcutaneous encystation at the level of the lower ribs was found. The diagnosis was made by identifying Fasciola hepatica from the encysted fluid.

It is of interest to note that among the causes of death in infants the following cases are reported, one case of volvulus neonatorum, one case of intussusception, one case of exomphalus, two cases of pyloric stenosis and one case of congenital heart disease.

B. *Schools (British children).*

All schools are inspected and reports sent in annually. These reports deal in detail with the health and development of the children, and give an exact picture of the hygienic state of the schools.

The general health and development was very satisfactory in all but one small school where twenty-eight out of thirty-three children were found to be suffering from defects of one kind or another. This high percentage was explained by the fact that most of these children's fathers were enlisted for war emergencies, and thus the children had not been cared for previously up to Army standards. The principal defect as in previous years was dental caries, 25 per cent. of all children being affected ; the next largest group was enlarged tonsils and adenoids with a rate of 13 per cent. All the other defects grouped together gave a rate of less than 10 per cent.

The school buildings on the whole are satisfactory and accommodation adequate.

Lighting.—In many schools has been improved but in a few, further improvement is still desired.

Warming.—Issue of coal for warming purposes in some schools is insufficient and in one school loss of attendances due to common cold was attributed to this. A desire for drying facilities in the monsoon is expressed from some schools.

Seats and desks.—Much has been done during the past two years to conform to the approved standards ; and it can now be said that in no school are seats and desks unsatisfactory.

Drinking water.—Some schools have been provided with fountains, but a tendency for the children to put their mouths to the nozzle has been noted. A guard to prevent this habit has been suggested.

Cleanliness.—In conclusion it is worthy of mention that in no case has the state of cleanliness been unsatisfactory and that most schools are reported excellent or very good.

C. *Child Welfare and Welfare Centres.*

British.—In the larger stations welfare centres for British families are in existence but in the smaller ones this work is carried out in the British families hospitals.

The work of the welfare centres consists of fortnightly meetings at which lectures are given for the mothers, knitting and sewing classes are held, infant weighing is regularly carried out, advice on infant feeding is given and infant foods and tonics are made available at wholesale prices.

In many centres the activities of the year included a baby show and fate.

Indian.—The present years has shown a further increase in child welfare work among Indian troops families. The barriers of caste and religion though still present are gradually being overcome ; and probably the care of the sick in the Indian families hospitals is one of the most potent factors in bringing about this change.

The welfare work consists of two principal parts : the treatment of the sick and the hygiene of healthy families. Both these parts are essential ; and the remarks of the president of one welfare centre are worth quoting. He states that " The Indian troops families hospital is the greatest asset in promoting the welfare and contentment of the unit ".

It is felt that there is still much to be done in the way of organising this work on a station rather than on unit basis. The ideal would seem to be, one central hospital in each station with separate clinics for each large unit. A central hospital whose medical staff would also act in an advisory capacity to the unit clinics would materially improve the medical arrangements while in no way detracting from the personal interest taken by each unit in its own clinic. A system on these lines is at present giving satisfaction in Quetta where the central families hospital serves seven clinics.

(*a*) *Approximate strength of women and children (Indian).*

Women.	*Children.*
22,472	32,201

(*b*) *Approximate numbers dealt with by welfare centres.*—The actual number dealt with at welfare centres is progressively increasing each year though the approximate strength of the families remains the same. This does not mean that the health of the women and children has deteriorated but that there are more facilities for treating cases and that more use is being made of these facilities.

The approximate numbers (out-patients and in-patients) dealt with during the year were :—

Women.	*Children.*
72,196	104,391

(*c*) *Progress of the work done.*—The work done has been increasing from year to year. As in previous years, the main difficulty to further rapid progress is a financial one. Quetta shows a notable increase from 3 to 6 unit centres in one year, necessitating the employment of two lady sub-assistant surgeons as against one in the previous year. The system commenced in Quetta at the beginning of 1940 whereby a medical officer from the Indian military hospital, acted as honorary medical officer to the hospital and unit clinics, and where all the specialists acted as consultants when called upon, is the ideal to be aimed at in all stations.

(*d*) *Accommodation.*—The majority of welfare centres are acommodated in converted married quarters in the unit lines. This is an ideal arrangement for the welfare centres and unit out-patient clinics, but not for the hospital.

The number of families hospitals is still inadequate. Where no hospital exists, serious cases are sent by arrangement to the cantonment, civil or mission hospitals, but experience has shown that the families prefer admission to a military families hospital where they will be looked after by nurses, assistant surgeon or medical officers whom they have met already at the welfare centres.

The approximate number of unit welfare centres is 173 which shows an increase of 89 since last year :

Northern Command 85, Southern Command 40,

Eastern Command 34, Western Independent District 14.

(*e*) *Staffs.*—The staffs at the welfare centres consist of voluntary and paid workers. Among the first group are the wives of officers in the units and medical officers from the military hospitals. The paid workers consist of lady sub-assistant surgeons, trained nurses, nurse dais, chowkidars and female sweepers. There are 33 lady sub-assistant surgeons employed of which 13 are paid from Government funds, 9 from the Indian Expeditionary Force Canteen Profits funds, 5 from unit subscription, 4 from Indian Maternity and Child Welfare Bureau funds and 2 from the Provincial Red Cross funds.

In some stations two lady sub-assistant surgeons are employed, while in others none. In a few smaller stations part time lady doctors from the civil hospitals do the work when called upon.

(*f*) *Funds.*—As in previous years a large proportion of the funds come from subscriptions from the men and from the officers and their wives. The Government pays the salaries of 13 lady sub-assistant surgeons ; the Indian Expeditionary Force Canteen Profits fund pays the salaries of some lady sub-assistant surgeons and gives grants towards running expenses and capital outlay on buildings ; the Maternity and Child Welfare Centre Bureau Indian Red Cross Society and Provincial Red Cross Society also make substantial grants to various welfare centres.

The distribution of funds is based on the estimated needs and the demands received from all centres in their annual report and budget request forms, Form A.G.26.

(*g*) *Confinements.*—Wide variations between different centres in the use of the hospitals for maternity cases exists. In one centre where there were 164 confinements all took place in hospital and none in the quarters, while in another centre, which had 28 confinements, 26 took place in the quarters and only 2 in the hopsital which had 3 maternity beds. This would have accommodated about 8 cases per month. The attitude of the families to the hospital can be influenced largely by good propaganda during the ante-natal period.

The number of confinement cases is approximately the same as last year. Out of 2,515 cases of parturition there were only 7 deaths and while these figures are not strictly speaking comparable with the 5-6 deaths per 1,000 live births, the usual figures in Great Britain, yet they do show a very satisfactory state of affairs among the Indian troops' families.

(*h*) *Principal diseases—General.*—A tabulated list of diseases is given in Table 115. While there is still some doubt as to the validity of some of the figures, owing to the diagnoses being made by nurses, yet each year increased care is taken in recording proper diagnoses. Laboratory facilities are also being used in a much larger scale.

Malaria.—The number of cases of malaria for all India shows a moderate increase from last year. This can be said of each Command except the Eastern Command which shows a decrease. This does not necessarily mean that malaria has become more prevalent, but rather that more cases are being diagnosed and treated. This is only to be expected in view of the increase in the number of the centres. It is worthy of note that only one woman and two children died from malaria in the past year as opposed to eight women and nine children in the previous year.

Methods of treatment still vary. While some centres use only quinine others give the quinine, atebrin and plasmoquine course. The proper treatment of malaria is of great importance in removing a reservoir of infection from the unit lines. The stations showing the highest percentage of malaria cases are Abbottabad, Ahmedabad, Bannu, Dehra Dun, Kirkee and Saugor.

Dysentery-diarrhoea group.—This group still provides one of the largest causes of mortality and sickness among infants. The treatment of this disease in infants is extremely difficult and unsatisfactory under the conditions prevailing in many of the hospitals. Many of these infants are brought to hospital already in a moribund state. It would seem that this problem could be tackled more successfully by prevention rather than cure.

Enteric group.—The number of cases treated shows a marked increase on the previous year. This is probably due to better diagnosis, because while the numbers have increased from 249 to 443 cases yet the deaths have decreased from 10 to 6. Regular inoculations and proper record keeping of inoculations will do much to control this group. In some centres inoculations and record keeping are done in a business-like manner, while other centres have been remiss in this matter.

The principal outbreaks of this group of fevers occurred in Abbottabad (270 cases), Kirkee (37 cases), Quetta (23 cases), Ambala (22 cases), Rawalpindi (12 cases) and in Bannu (11 cases).

Tuberculosis.—This disease continues at about the same level as in the previous year. A remarkable feature is that the incidence is very much higher in Northern Command than in the rest of India. The total number of women and children in Northern Command is 9,852 and 13,836 respectively and in the rest of India 12,620 and 18,365 yet Northern Command has 115 and 88 cases of tuberculosis in women and children respectively whereas the rest of India only 69 and 26. While all stations in Northern Command seem to have a fair share of tuberculosis two stations have outstandingly high figures. Peshawar, with a total population of 3,871 women and children, has 100 cases of tuberculosis ; and Risalpur, with 1,635 women and children, has 27 cases. The explanation of this high rate of tuberculosis in Northern Command is not clear ; and, in view of the fact that the figures for the previous year are somewhat similar, a further investigation into this matter is being undertaken. The disposal of Indian women and children suffering from tuberculosis is one of the most difficult social problems confronting the medical staff of welfare centres.

Eye diseases.—The out-patient cases for these conditions form one of the largest groups. The cases are mainly mild in nature and relatively few require admission. No deaths occurred in this group.

Ear diseases.—The prevalence of ear diseases is not high.

Respiratory diseases.—Cases of respiratory disease, apart from pneumonia, are numerous and, while mainly mild, it is worthy of note that they accounted for the deaths of 4 women and 14 children. Pneumonia has been the largest single cause of death in children, which is disappointing in view of the proved value of the sulphonamide drugs. One factor however with which medical officers have to contend is that these children are often brought to hospital when the disease is so advanced that they are seriously ill, if not moribund.

Infectious diseases (other than typhoid and dysentery).—Infectious diseases have not been prevalent. Epidemics of measles occurred in Almora (27 cases), Lucknow (40 cases), Shillong (99 cases) and in Dharmsala (17 cases). Cerebro-spinal fever broke out in the Royal Signals unit at Meerut where 130 women and 250 children were affected but no deaths occurred. This was a very local epidemic as the other units in Meerut were not involved. In Abbottabad there were 10 deaths from cerebro-spinal fever, but as 8 of these cases occurred outside the hospital the figures for the total cases were not given. Diphtheria did not show epidemic proportions except in Cannanore where 18 cases occurred. In Abbottabad 74, Risalpur 18 and in Jubbulpore 15 cases of mumps were reported.

TABLE

Statement showing work done in

Commands.	Malaria.	Dysentery.	Enteric fevers.	Enteritis and diarrhœa.	Other digestive diseases.
Northern.					
Admissions—					
Women	346	66	91	87	225
Children	185	73	117	334	247
Out-Patients—					
Women	2,544	603	42	1,882	6,792
Children	3,286	855	102	5,241	7,754
Deaths—					
Women	1	2	2	..	..
Children	2	12	2	36	3
Eastern.					
Admissions—					
Women	76	35	5	50	115
Children	67	50	13	206	98
Out-patients—					
Women	950	140	3	476	2,672
Children	1,024	236	7	2,303	3,427
Deaths—					
Women	..	1	1	..	..
Children	..	4	..	34	2
Southern.					
Admissions—					
Women	64	28	1	52	151
Children	13	14	2	36	68
Out-Patients—					
Women	1,003	74	20	940	3,756
Children	1,246	113	16	2,532	4,593
Deaths—					
Women	..	..	1	..	..
Children	..	..	..	7	..
Western (I) District.					
Admissions—					
Women	12	4	10	8	13
Children	18	10	11	24	3
Out-Patients—					
Women	187	18	2	160	218
Children	312	26	1	339	310
Deaths—					
Women	..	..	..	..	..
Children	..	2	..	3	..
All India.					
Admissions—					
Women	498	133	107	197	504
Children	283	147	143	600	416
Out-patients—					
Women	4,684	835	67	3,459	13,438
Children	5,868	1,230	126	10,415	16,084
Deaths—					
Women	1	3	4	..	..
Children	2	19	2	80	5

Note.—" Out-patients " include cases treated

115.

Army Child Welfare Centres (Indian Troops) 1940.

Tuber-culosis.	Pneu-monia.	Other respiratory diseases.	Diseases of the eye.	Partu-rition.	Affections of parturition.	Generative system.	Minor septic diseases.	Total-all causes.
40	54	115	408	686	185	253	112	2,001
31	242	343	219	..	..	17	219	2,757
75	32	3,045	3,514	367	1,760	2,589	1,478	32,414
57	179	7,465	7,432	..	..	172	2,828	48,352
13	2	1	..	4	2	..	..	33
6	42	8	..	..	..	..	1	171
12	18	72	41	284	54	189	28	1,150
1	117	188	78	..	..	..	50	1,243
27	24	1,593	2,309	258	398	1,339	598	16,826
23	120	3,379	4,498	..	..	..	1,554	27,523
11	1	1	..	1	1	..	..	27
4	36	3	..	..	..	..	..	111
8	2	31	39	351	101	40	4	1,083
..	17	111	147	..	..	3	4	786
14	13	1,292	651	153	537	791	375	14,952
1	93	3,749	1,522	..	..	12	629	20,709
1	..	1	..	..	..	..	..	5
1	2	..	..	..	..	..	..	32
5	4	15	4	336	10	22	6	484
..	17	13	7	..	..	..	11	171
3	2	160	141	80	61	498	46	2,326
1	4	201	363	..	..	..	92	2,850
3	..	1	..	2	..	1	..	10
..	5	3	..	..	..	..	..	20
65	78	233	192	1,657	350	504	150	5,678
32	393	655	451	..	..	20	284	4,957
119	71	6,090	6,615	858	2,756	5,217	2,497	66,518
82	396	14,794	13,815	..	..	184	5,103	99,434
28	3	4	..	7	3	1	..	75
11	85	14	..	..	..	..	1	34

in their quarters.

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ON THE

HEALTH OF THE ARMY IN INDIA

FOR THE YEAR

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GENERAL HEADQUARTERS, INDIA.
Medical Directorate
New Delhi

PUBLISHED BY THE MANAGER OF PUBLICATIONS, DELHI.
PRINTED BY THE MANAGER, GOVERNMENT OF INDIA PRESS, NEW DELHI.
1942.

Price Re. 1-6-0 or 2sh.

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ANNUAL REPORT

ON THE

HEALTH OF THE ARMY IN INDIA

FOR THE YEAR

1940

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VOLUME III

PART II

(Statistics)

Z.-20430/D. M. S. 5 (b).

GENERAL HEADQUARTERS, INDIA.

Medical Directorate

New Delhi

PUBLISHED BY THE MANAGER OF PUBLICATIONS, DELHI.
PRINTED BY THE MANAGER, GOVERNMENT OF INDIA PRESS, NEW DELHI.
1942.

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TABLE A.

TABLE SHOWING HEIGHTS ABOVE SEA LEVEL AND RAINFALL BY STATIONS AND COMMANDS.

Station.	Height above sea level in feet.	Temperatures				Humidity Relative percentage		Rainfall in inches		Wettest month.	Number of rainy days.
		Maximum		Minimum							
		Mean	Highest in year.	Mean	Lowest in year.	Mean 8 hrs.	Mean 17 hrs.	Total for year.	Heaviest fall in one day.		
Northern Command.											
Abbottabad	4,010	80·2	106	56·8	35	73	...	68·94	6·94	July	80
Ambala	902	89·2	115	62·1	37	62	34	24·51	2·02	July	39
Amritsar	754	89·1	115	61·7	35	66	35	14·44	1·93	September	24
Bakloh	4,585	...	...	...	...	...	...	78·54	5·92	July	87
Bannu	1,250	88·4	115	63·6	38	45	...	10·36	1·57	September	25
Barian	7,133	63·0	85	47·5	22	53	54	51·12	2·51	February	80
Campbellpore	1,180	84·4	111	56·6	29	59	36	39·79	3·78	February	49
Cherat	4,546	72·7	101	57·3	30	53	...	32·55	2·94	March	37
Chitral	4,980	71·3	103	52·9	26	57	...	22·56	1·53	April	47
Dagshai	6,087	62·7	82	49·9	30	48	54	51·65	6·13	July	75
Dalhousie	7,687	...	...	...	...	...	...	78·54	5·92	July	87
Dera Ismail Khan	568	90·5	115	62·1	34	57	40	5·82	1·11	September	15
Dharamsala Cantt.	4,500	...	...	...	...	...	...	78·54	5·92	July	87
Drosh Fort	4,340	71·3	103	52·9	26	57	...	22·56	1·53	April	47
Ferozepore	649	89·1	115	61·7	35	66	35	14·44	1·93	September	24
Gharial	6,811	63·0	85	47·5	22	53	54	51·12	2·51	February	80
Jhelum	762	86·6	113	62·3	34	65	42	27·07	2·11	February	40
Jullundur	771	90·00	116	62·5	36	60	33	17·35	1·53	August	32
Jutogh	6,370	62·07	82	49·9	30	48	54	51·65	6·13	July	75
Kalabagh Baragali	7,963	63·0	85	47·5	22	53	54	51·12	2·51	February	80
Kalabagh Mari Indus	682	90·5	115	62·1	34	57	40	5·82	1·11	September	15
Kasauli	6,050	62·07	82	49·9	30	48	54	51·65	6·13	July	75
Khanspur—Ghora Dhakka	7,721	63·0	85	47·5	22	53	54	51·12	2·51	February	80
Kohat	1,725	84·7	111	59·5	33	56	33	14·35	1·50	March	27
Kuldana	7,049	63·0	85	47·5	22	53	54	51·12	2·51	February	80
Lahore	706	89·1	115	61·7	35	66	35	14·44	1·93	September	24
Landikotal	3,509	84·7	111	59·7	33	56	33	14·35	1·50	March	27
Lockhart. Fort	6,613	84·7	111	59·5	33	56	33	14·35	1·50	March	27
Malakand	2,740	84·7	111	59·5	33	56	33	14·35	1·50	March	27
Manzai	1,650	84·4	111	56·6	...	59	36	39·79	3·78	February	49
Mardan	1,000	84·7	111	59·9	33	56	33	14·35	1·50	March	27
Mir Ali	2,240	88·4	115	63·6	38	45	...	10·36	1·57	September	25
Mona	3,500	89·7	113	62·9	35	52	28	13·56	1·88	September	27
Multan	404	91·0	115	65·1	35	59	32	5·13	1·70	September	12
Murree	7,073	63·0	85	47·5	22	53	54	51·12	2·51	February	80
Nowshera	966	84·7	111	59·5	33	56	33	14·35	1·50	March	27
Peshawar	1,152	84·7	111	59·5	33	56	33	14·35	1·50	March	27
Rawalpindi	1,689	84·4	111	56·6	...	59	36	39·79	3·78	February	49

TABLE A—*contd.*

TABLE SHOWING HEIGHTS ABOVE SEA LEVEL AND RAINFALL BY STATIONS AND COMMANDS.—*contd.*

Station.	Height above sea level in feet.	Temperatures				Humidity Relative percentage		Rain fall in inches		Wettest month.	Number of rainy days.
		Maximum		Minimum							
		Mean	Highest in year.	Mean	Lowest in year.	Mean 8 hrs.	Mean 17 hrs.	Total for year.	Heaviest fall in one day.		
Northern Command—contd.											
Razmak	6,556	76·0	102	50·1	21	55	...	...	...	...	...
Risalpur	1,014	84·7	111	59·5	33	56	33	14·35	1·50	February	49
Sargodha	615	89·7	113	62·9	35	52.	28	13·56	1·88	September	27
Shagai	3,174	84·7	111	59·5	33	56	33	14·35	1·50	February	49
Sialkot	829	86·6	113	62·3	34	65	42	27·07	2·11	February	40
Solon	5,078	62·07	82	49·9	30	48	54	51·65	6·13	July	75
Subathu	4,000	...	...	...	...	...	...	...	...	...	...
Thal	2,450	88·4	115	63·6	38	45	...	10·36	1·57	September	25
Wana	4,530	76·0	102	50·1	21	55	...	...	...	...	...
Western (Ind.) District.											
Chaman	5,502	78·3	105	55·1	21	40	28	11·92	1·51	February	33
Fort Sandaman	4,600	79·2	105	54·3	26	48	25	11·54	1·46	July	33
Hindubagh	5,821	73·0	98	43·7	20	59	39	13·44	1·46	February	34
Hyderabad (Sind)	96	93·1	118	68·6	44	57	29	1·26	·34	February	5
Karachi	28	87·7	107	68·1	42	67	49	3·31	·83	March	9
Loralai	4,699	...	...	...	...	...	...	16·36	1·73	March	29
Quetta	5,510	73·0	98	43·7	20	59	39	14·00	1·46	February	37
Eastern Command.											
Agra Fort	525	90·5	115	63·9	37	59	35	40·01	11·26	September	28
Alipore	17	89·3	107	71·9	51	84	65	78·30	4·60	August	89
Allahabad	314	89·5	112	65·8	42	72	51	39·86	...	...	...
Almora	6,494	62·7	80	48·3	27	56	59	44·97	2·34	June	72
Bareilly	563	89·1	113	65·5	42	68	43	30·51	2·91	September	36
Barrackpore	24	89·3	107	71·9	51	84	65	78·30	4·60	August	89
Benares	256	90·0	112	67·7	43	68	43	35·14	2·13	June	55
Cawnpore	407	92·3	115	68·1	44	64	41	34·40	4·70	September	48
Chakrata	6,885	62·7	80	48·3	27	56	59	44·97	2·34	June	72
Chittagong	32	86·0	96	70·5	52	82	73	108·2	5·75	July	104
Comilla	33	87·5	99	70·4	50	83	70	91·41	5·90	July	98
Dacca	20	88·0	102	71·3	52	82	66	77·36	4·40	August	91
Dehra Dun	2,232	82·6	106	59·5	39	67	48	100·66	9·21	August	81
Delhi	757	89·6	114	64·8	37	51	31	17·66	2·49	August	33
Dinapore	170	88·8	111	69·4	46	70	52	53·54	3·35	August	60
Fatehgarh	467	91·1	114	65·3	40	63	42	20·76	2·59	September	25
Fort William	17	89·3	107	71·9	51	84	65	78·30	4·60	August	89
Fyzabad	330	89·5	112	65·8	42	72	51	39·86	5·08	July	49
Ghoom	7,313	59·7	74	48·2	34	82	...	110·28	5·26	October	110

Gorakhpur (Kunraghat)	250	89·1	111	68·1	45	71	52	54·05	3·60	July		61
Gyantsi	13,120	55·4	89	29·6	2	55	...	1·57	0·14	October		2
Jhansi	849	90·8	113	66·4	42	53	35	34·14	3·61	July		46
Landour	7,528	64·9	88	50·1	30	67	71	65·47	4·84	June		82
Lansdowne	5,823	62·7	80	48·3	27	56	59	44·97	2·34	June		72
Lucknow	383	90·4	113	66·4	41	68	50	33·62	4·29	July		46
Lebong	6,000	59·7	74	48·2	34	82	...	110·28	5·26	October		110
Meerut	737	...	...	...	...	...	...	21·55	2·13	June		33
Midnapore	90	90·5	112	71·0	50	78	60	60·38	3·81	July		78
Muttra	560	90·5	115	63·9	37	59	35	40·01	11·26	September		28
Nowgong	735	90·5	113	63·9	38	61	47	40·26	4·18	July		52
Port Blair	9	84·4	92	73·8	66	85	80	109·56	7·36	May		136
Ranikhet	5,980	62·7	80	48·3	27	56	59	44·97	2·34	June		72
Roorkee	979	86·7	111	62·1	36	65	41	30·92	2·25	August		43
Saidpur	210	...	...	...	...	...	...	...	...	...		...
Shillong	4,921	76·5	86	54·0	23	74	77	87·09	5·16	June		124
Southern Command.												
Ahmedabad	162	94·7	108	71·4	55	52	31	19·89	5·53	August		23
Ahmednagar	2,180	89·6	108	64·2	43	53	33	15·05	1·06	August		30
Aurangabad	1,905	90·2	107	67·1	46	51	34	27·14	3·61	August		36
Bangalore	3,002	83·0	95	64·6	82	77	48	35·26	3·57	April		56
Baroda	114	94·2	109	65·5	44	63	40	25·05	5·83	August		24
Belgaum	2,523	84·7	101	64·2	50	78	55	64·74	5·41	June		74
Bombay (Colaba)	20	86·9	96	74·4	64	76	68	54·34	9·12	July		62
Cannanore	40	87·6	93	74·4	66	81	74	115·29	4·63	June		111
Deolali	1,894	89·3	104	63·7	47	64	41	17·94	1·28	August		37
Jubbulpore	1,320	89·8	112	64·2	39	65	42	53·88	3·70	August		61
Kamptee	940	92·4	114	68·5	45	58	39	36·94	4·66	July		46
Madras	250	90·9	110	75·4	60	72	55	33·62	2·87	November		49
Malapuram	1,380	88·7	100	70·5	60	72	50	24·02	2·85	October		33
Mhow	1,887	88·2	107	63·3	40	57	32	32·20	6·05	August		38
Mount Abu	3,836	76·4	94	61·0	43	53	54	19·79	3·35	September		29
Nasirabad	1,461	94·7	108	71·4	55	52	31	19·89	5·53	August		23
Pachmarhi	3,490	81·0	101	60·2	36	54	47	96·83	10·70	August		71
Poona	1,867	89·3	104	63·7	43	64	41	17·94	1·28	August		37
Sauger	1,755	87·2	109	66·9	49	50	37	42·85	6·07	July		58
St. Thomas Mount	34	86·2	94	77·6	67	81	78	29·32	4·90	November		39
Secunderabad	1,776	90·7	110	68·5	46	68	45	20·86	1·89	July		42
Trichinopoly	256	90·7	110	68·5	46	68	45	20·86	1·89	July		42
Trimulgherry	1,843	92·7	105	74·8	63	72	47	52·13	11·74	November		56
Wellington	5,800	65·9	77	48·8	30	70	73	55·51	8·83	June		76

APPENDIX I.

BRITISH OTHER RANKS

ALL INDIA.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick during the year 1940.

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Specific Diseases due to infection or infestation.				
Common cold	9·3	..	..	0·16
Diphtheria	2·4	0·06	..	0·24
Dysentery	33·0	0·06	0·06	1·38
Enteric fevers (inclusive of typhoid, Para. A, B. and C. and enteric group)	1·2	..	..	0·17
Erysipelas	0·3	..	..	0·01
Influenza	12·1	..	..	0·31
Malaria	73·4	..	..	2·83
Measles	1·7	..	..	0·07
Meningococcal infection	0·2	..	..	0·03
Mumps	0·7	..	..	0·02
Pneumonia	6·0	0·06	..	0·47
Pyrexia of uncertain origin	0·4	..	..	0·04
Rheumatic fever	1·7	..	0·18	0·27
Sandfly fever	25·7	..	..	0·74
Scarlet fever	0·5	..	..	0·05
Smallpox	0·4	0·03	..	0·04
Tuberculosis — Pulmonary	2·2	0·06	1·17	0·55
Tuberculosis — Other	0·1	..	0·06	0·03
Venereal Diseases — Gonorrhoea	30·9	..	0·03	1·79
Venereal Diseases — Soft chancre	8·9	..	..	0·65
Venereal Diseases — Syphilis	12·7	..	..	0·94
Venereal Diseases — Other V. D.	5·6	..	..	0·30
Other diseases due to infection	13·7	0·12	0·06	0·53
Diseases due to infestation by metazoan parasites — Scabies	1·7	..	..	0·07
Diseases due to infestation by metazoan parasites — Other diseases	3·4	..	..	0·11
Other diseases classified under systems.				
Diseases of the nervous system	10·8	0·15	0·47	0·50
Mental diseases	3·2	..	1·40	0·56
Diseases of the—				
Eye	4·0	..	0·12	0·18
Ear and nose	33·3	..	0·09	0·96
Circulatory system — Valvular disease of the heart	0·5	..	0·18	0·08
Circulatory system — Disordered action of the heart	2·3	0·03	0·09	0·13
Circulatory system — Other diseases	2·8	0·09	0·15	0·20
Blood and blood forming organs	8·7	0·12	..	0·59
Ductless or endocrine glands	0·3	..	..	0·05
Breast	0·1	..	..	0·00
Respiratory system — Larynx and trachea	1·8	..	..	0·05
Respiratory system — Bronchi and bronchioles	21·0	..	0·15	0·84
Respiratory system — Other diseases	2·9	..	0·06	0·31
Teeth and gums	3·8	..	..	0·08
Digestive system — Inflammation of tonsils	43·2	..	..	1·14
Digestive system — Inflammation of pharynx	15·3	..	..	0·36
Digestive system — Inflammation of stomach	8·5	..	..	0·26
Digestive system — Gastric ulcer	1·0	..	0·09	0·09
Digestive system — Doudenal ulcer	1·1	..	0·09	0·10
Digestive system — Liver	10·1	..	..	0·52
Digestive system — Other diseases	69·8	0·15	0·06	2·43
Diseases due to disorders of nutrition or of metabolism	0·1	..	0·03	0·01

Diseases.	Admissions	Deaths.	Invalids	Constantly sick.
Diseases of the—				
Generative system	17·9	..	0·03	0·75
Bones, joints, muscles, fasciae and bursae	22·7	..	0·34	1·16
Areolar tissues	62·8	0·03	..	2·14
Skin	45·0	..	0·15	1·95
Urinary organs	7·7	0·03	0·34	0·56
Injuries — General	8·2	0·52	..	0·28
Injuries — Local	57·6	0·55	0·22	2·51
Injuries — In action	1·2	0·55	0·44	0·27
Tumours and cysts	2·4	0·09	0·09	0·11
Poisons	0·3	..	..	0·01
No appreciable disease	4·1	..	...	0·20
*Suicides	0·0	0·12	..	0·00
Total	723·3	2·77	6·81	30·97

*The figures against "Suicide" having already been shown under the heading of the injury, etc., which caused deaths, are not included in the total.

APPENDIX II.

BRITISH OTHER RANKS

NORTHERN COMMAND.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick during the year 1940.

Diseases.		Admissions.	Deaths.	Constantly sick.
Specific diseases due to infection or infestation.				
Common cold		5·9	..	0·07
Diphtheria		3·3	0·09	0·30
Dysentery		34·6	0·09	1·34
Enteric fevers (inclusive of typhoid, Para. A. B. and C. and enteric group)		2·7	..	0·32
Erysipelas		0·4	..	0·01
Influenza		12·5	..	0·27
Malaria		119·3	..	3·71
Measles		0·4	..	0·02
Meningococcal infection		0·1	..	0·01
Mumps		0·1	..	0·01
Pneumonia		5·8	..	0·59
Pyrexia of uncertain origin		0·3	..	0·02
Rheumatic fever		1·8	..	0·27
Sandfly fever		51·3	..	1·03
Scarlet fever		1·2	..	0·13
Smallpox		0·4	..	0·05
Tuberculosis	Pulmonary	2·2	0·09	0·50
	Other	0·2	..	0·04
Venereal Diseases	Gonorrhoea	27·0	..	1·26
	Soft chancre	3·4	..	0·27
	Syphilis	8·1	..	0·51
	Other V. D.	1·9	..	0·08
Other diseases due to infection		5·8	0·18	0·22
Diseases due to infestation by metazoan parasites	Scabies	0·8	..	0·02
	Other diseases	3·8	..	0·10
Other diseases classified under systems.				
Diseases of the nervous system		11·2	0·09	0·46
Mental diseases		2·6	..	0·56
Diseases of the—				
Eye		2·7	..	0·07
Ear and nose		38·4	..	1·14
Circulatory system	Valvular disease of the heart	0·1	..	0·02
	Disordered action of the heart	2·1	..	0·14
	Other diseases	2·3	0·09	0·14
Blood and blood forming organs		6·7	0·18	0·55
Ductless or endocrine glands		0·4	..	0·05
Breast		..	..	..
Respiratory system	Larynx and trachea	2·2	..	0·07
	Bronchi and bronchioles	25·0	..	0·98
	Other diseases	2·4	..	0·34
Teeth and gums		3·7	..	0·07
Digestive system	Inflammation of tonsils	44·0	..	1·24
	Inflammation of pharynx	17·9	..	0·39
	Inflammation of stomach	11·8	..	0·32
	Gastric ulcer	0·4	..	0·05
	Duodenal ulcer	0·2	..	0·03
	Liver	12·8	..	0·66
	Other diseases	74·3	..	2·32
Diseases due to disorders of nutrition or of metabolism		0·2	..	0·01

Diseases.		Admission.	Deaths.	Constantly sick.
Diseases of the—				
Generative system		16·1	..	0·61
Bones, joints, muscles, fasciae and bursae		25·2	..	1·16
Areolar tissues		61·7	..	2·02
Skin		36·1	..	1·53
Urinary organs		6·7	0·09	0·57
Injuries	General	12·5	0·54	0·39
	Local	53·7	0·36	2·12
	In action	3·5	1·62	0·79
Tumours and cysts		2·3	0·18	0·10
Poisons		0·4	..	0·01
No appreciable disease		3·1	..	0·09
*Suicides		..	..	..
	Total	775·9	3·60	30·02

*The figures against "Suicide" having already been shown under the heading of the injury, etc. which caused deaths, are not included in the total.

APPENDIX III.

BRITISH OTHER RANKS.

WESTERN (INDIA) DISTRICT.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick during the year 1940.

Diseases.	Admissions.	Deaths.	Constantly sick.
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.			
Common cold	13·4	..	0·29
Diphtheria	..	..	..
Dysentery	41·2	0·51	1·63
Enteric fevers (inclusive of typhoid, para. A. B. and C. and enteric group).	..	..	..
Erysipelas	1·0	..	0·03
Influenza	1·5	..	0·06
Malaria	66·4	..	3·63
Measles	4·1	..	0·22
Meningococcal infection	..	..	..
Mumps	0·5	..	0·02
Pneumonia	4·1	..	0·25
Pyrexia of uncertain origin	4·6	..	0·42
Rheumatic fever	4·1	..	0·54
Sandfly fever	27·3	..	0·81
Scarlet fever	..	..	..
Smallpox	..	..	..
Tuberculosis — Pulmonary	2·1	..	0·40
Tuberculosis — Other	..	..	0·26
Venereal Diseases — Gonorrhoea	9·3	..	0·31
Venereal Diseases — Soft chancre	5·1	..	0·30
Venereal Diseases — Syphilis	8·7	..	0·48
Venereal Diseases — Other V. D.	2·1	..	0·08
Other diseases due to infection	7·2	..	0·28
Diseases due to infestation by metazoan parasites. — Scabies	3·1	..	0·13
Diseases due to infestation by metazoan parasites. — Other diseases	2·1	..	0·06
OTHER DISEASES CLASSIFIED UNDER SYSTEMS.			
Diseases of the nervous system	12·9	1·03	0·48
Mental diseases	3·1	..	0·18
Diseases of the—			
Eye	7·2	..	0·67
Ear and nose	23·7	..	0·73
Circulatory system — Valvular disease of the heart.	..	..	..
Circulatory system — Disordered action of the heart.	7·7	..	0·42
Circulatory system — Other diseases	2·6	..	0·25
Blood and blood forming organs	4·1	0·51	0·30
Ductless or endocrine glands	0·5	..	0·03
Breast	..	..	..
Respiratory system — Larynx and trachea	5·1	..	0·13
Respiratory system — Bronchi and bronchioles	27·3	..	1·11
Respiratory system — Other diseases	2·1	..	0·20
Teeth and gums	5·1	..	0·07
Digestive system — Inflammation of tonsils	48·9	..	1·70
Digestive system — Inflammation of pharynx	21·1	..	0·53
Digestive system — Inflammation of stomach	4·6	..	0·21
Digestive system — Gastric ulcer	..	..	..
Digestive system — Duodenal ulcer	1·5	..	0·19
Digestive system — Liver	6·7	..	0·31
Digestive system — Other diseases	74·6	..	3·35
Diseases due to disorders of nutrition or of metabolism.	..	..	

Diseases.	Admissions.	Deaths.	Constantly sick.
Diseases of the—			
Generative system	16·0	..	0·94
Bones, joints, muscles, fasciae and bursae	18·5	..	0·62
Areolar tissues	74·6	..	2·78
Skin	69·0	..	3·09
Urinary organs	7·7	..	0·65
Injuries — General	0·5	..	0·01
Injuries — Local	64·8	..	2·50
Injuries — In action	..	..	..
Tumours and cysts	1·0	..	0·08
Poisons	..	..	..
No appreciable disease	7·7	..	0·73
Suicides*	..	..	..
TOTAL	726·7	2·06	32·44

* The figures against "Suicide" having already been shown under the heading of the injury, etc., which caused deaths, are not included in the total.

APPENDIX IV.

BRITISH OTHER RANKS.

EASTERN COMMAND.

Table showing ratios per 1,000 of the strength of admissions into hospitals, deaths and constantly sick during the year 1940.

Diseases.	Admissions.	Deaths.	Constantly sick.
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.			
Common cold	15·3	..	0·28
Diphtheria	0·5	..	0·06
Dysentery	36·7	..	1·62
Enteric fevers (inclusive of typhoid, para. A. B. and C. and enteric group).	0·1	..	0·03
Erysipelas	0·3	..	0·01
Influenza	7·3	..	0·18
Malaria	42·5	..	2·07
Measles	2·1	..	0·10
Meningococcal infection	0·3	..	0·03
Mumps	0·1	..	0·00
Pneumonia	4·8	0·10	0·37
Pyrexia of uncertain origin	0·2	..	1·12
Rheumatic fever	1·4	..	0·28
Sandfly fever	15·3	..	0·33
Scarlet fever	0·1	..	0·00
Smallpox	0·5	..	0·05
Tuberculosis — Pulmonary	2·1	0·10	0·72
Tuberculosis — Other	0·2	..	0·00
Venereal Diseases — Gonorrhoea	39·3	..	2·41
Venereal Diseases — Soft chancre	12·2	..	0·97
Venereal Diseases — Syphilis	12·1	..	0·96
Venereal Diseases — Other V. D.	5·5	..	0·33
Other diseases due to infection	20·7	0·20	0·72
Diseases due to infestation by metazoan parasites — Scabies	1·7	..	0·06
Diseases due to infestation by metazoan parasites — Other diseases	2·7	..	0·15
OTHER DISEASES CLASSIFIED UNDER SYSTEMS.			
Diseases of the nervous system	11·0	0·10	0·42
Mental diseases	3·2	..	0·48
Diseases of the—			
Eye	4·3	..	0·20
Ear and nose	31·9	..	0·83
Circulatory system. — Valvular disease of the heart	1·2	..	0·15
Circulatory system. — Disordered action of the heart	2·4	0·10	0·14
Circulatory system. — Other diseases	3·2	0·20	0·23
Blood and blood forming organs	8·6	0·10	0·54
Ductless or endocrine glands	0·4	..	0·09
Breast	..	..	..
Respiratory system. — Larynx and trachea	1·7	..	0·04
Respiratory system. — Bronchi and bronchioles	20·1	..	0·85
Respiratory system. — Other diseases	3·5	..	0·42
Teeth and gums	4·0	..	0·08
Digestive system. — Inflammation of tonsils	43·7	..	0·98
Digestive system. — Inflammation of pharynx	8·7	..	0·17
Digestive system. — Inflammation of stomach	9·6	..	0·30
Digestive system. — Gastric ulcer	1·0	..	0·11
Digestive system. — Duodenal ulcer	1·5	..	0·08
Digestive system. — Liver	10·0	..	0·54
Digestive system. — Other diseases	68·0	..	2·24
Diseases due to disorders of nutrition or of metabolism.	0·3	..	0·03

Diseases.	Admissions.	Deaths.	Constantly sick.
Diseases of the—			
Generative system	19·3	..	0·78
Bones, joints, muscles, fasciae and bursae	24·3	..	1·37
Areolar tissues	71·0	0·10	2·33
Skin	52·4	..	2·29
Urinary organs	6·7	..	0·54
Injuries — General	9·3	0·20	0·31
Injuries — Local	58·4	0·61	2·39
Injuries — In action	..	..	..
Tumours and cysts	2·5	0·10	0·12
Poisons	0·4	..	0·01
No appreciable disease	4·1	..	0·19
Suicides*	..	0·10	..
TOTAL	710·8	1·93	30·97

* The figures against "Suicide" having already been shown under the heading of the injury, etc., which caused deaths, are not included in the total.

APPENDIX V.

BRITISH OTHER RANKS

SOUTHERN COMMAND.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick during the year 1940.

Diseases.	Admissions.	Deaths.	Constantly sick.
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.			
Common cold	6·0	..	0·11
Diphtheria	4·0	0·11	0·42
Dysentery	25·4	..	1·12
Enteric fevers (inclusive of typhoid, Para. A. B. and C, and enteric group).	1·0	..	0·17
Erysipelas	0·1	..	0·00
Influenza	18·9	..	0·56
Malaria	54·9	..	2·40
Measles	2·3	..	0·08
Meningococcal infection	0·2	..	0·05
Mumps	2·2	..	0·06
Pneumonia	7·8	0·11	0·47
Pyrexia of uncertain origin	..	..	..
Rheumatic fever	1·3	..	0·19
Sandfly fever	5·9	..	0·14
Scarlet fever	0·2	..	0·01
Smallpox	0·3	0·11	0·03
Tuberculosis — Pulmonary	2·3	..	0·46
Tuberculosis — Other	0·1	..	0·02
Venereal diseases — Gonorrhoea	31·3	..	2·08
Venereal diseases — Soft chancre	12·6	..	0·82
Venereal diseases — Syphilis	19·9	..	1·53
Venereal diseases — Other V. D.	11·0	..	0·59
Other diseases due to infection	17·2	..	0·77
Diseases due to infestation by metazoan parasites. — Scabies	2·6	..	0·12
Diseases due to infestation by metazoan parasites. — Other diseases	4·1	..	0·08
OTHER DISEASES CLASSIFIED UNDER SYSTEMS.			
Diseases of the nervous system	9·8	0·11	0·63
Mental diseases	4·0	..	0·75
Diseases of the—			
Eye	4·6	..	0·16
Ear and nose	30·7	..	0·94
Circulatory system. — Valvular diseases of the heart	0·5	..	0·10
Circulatory system. — Disordered action of the heart	1·3	..	0·04
Circulatory system. — Other diseases	3·1	..	0·23
Blood and blood forming organs	12·1	..	0·86
Ductless or endocrine glands	..	..	..
Breast	0·2	..	0·00
Respiratory system. — Larynx and trachea	0·5	..	0·01
Respiratory system. — Bronchi and bronchioles	15·8	..	0·61
Respiratory system. — Other diseases	2·9	..	0·20
Teeth and gums	3·6	..	0·08
Digestive system. — Inflammation of tonsils	40·5	..	1·06
Digestive system. — Inflammation of pharynx	18·0	..	0·48
Digestive system. — Inflammation of stomach	4·3	..	0·18
Digestive system. — Gastric ulcer	1·8	..	0·14
Digestive system. — Duodenal ulcer	1·6	..	0·19
Digestive system. — Liver	7·7	..	0·39
Digestive system. — Other diseases	65·5	0·54	2·56
Diseases due to disorders of nutrition or of metabolism.	..	..	0·01

Diseases.	Admissions.	Deaths.	Constantly sick.
Diseases of the—			
Generative system	19·1	..	0·84
Bones, joints, muscles, fasciae and bursae	19·0	..	1·04
Areolar tissues	53·0	..	1·95
Skin	43·0	..	1·87
Urinary organs	10·0	..	0·53
Injuries — General	3·6	0·97	0·18
Injuries — Local	59·8	0·86	3·12
Injuries — In action	..	..	..
Tumours and cysts	2·5	..	0·12
Poisons	0·1	..	0·01
No appreciable disease	4·4	..	0·24
Suicides*	..	0·32	..
TOTAL	672·7	2·81	31·79

* The figures against "Suicide" having already been shown under the heading of the injury, etc., which caused deaths, are not included in the total.

APPENDIX VI.

BRITISH OTHER RANKS.

Table showing monthly ratios per 1,000 of strength of admissions for certain diseases for all-India during the year 1940.

Months.	Group of Enteric fevers.	Influenza.	Cholera.	Small-pox.	Malaria.	Dysentery. Protozoal.	Dysentery. Bacillary.	Dysentery. Bacillary Ex-udate.	Dysentery. Clinical.	P. U. O.	Pneumonia (lobar and lobular).	Diarrhoea.	Dengue.	Sandfly fever.	Plague.	Effects of heat.	All Causes
January	0·08	4·5	...	...	1·4	0·02	0·4	...	0·1	...	0·7	0·6	0·2	0·08	...	...	51·7
February	0·03	0·7	...	...	1·2	0·1	2·0	0·4	0·5	0·03	0·2	1·5	0·2	0·3	...	...	54·3
March	0·1	2·4	...	0·05	1·4	0·1	2·4	0·5	0·8	0·02	0·2	2·2	0·2	0·4	...	...	52·2
April	0·3	0·8	...	0·03	1·9	0·01	3·6	0·4	1·1	0·06	0·6	4·0	0·2	1·4	...	0·2	58·7
May	0·08	0·6	0·03	0·1	2·6	0·4	1·9	0·3	0·6	0·1	0·3	2·4	0·3	5·4	...	0·4	62·2
June	0·2	0·6	...	0·1	4·3	0·3	1·4	0·4	0·3	...	0·4	2·4	0·2	3·1	...	2·6	64·4
July	0·1	0·7	...	...	7·0	0·4	2·0	0·3	0·4	...	0·2	1·9	0·6	6·0	...	2·2	74·7
August	0·2	0·1	...	...	8·6	0·3	2·7	0·4	0·8	0·03	0·4	3·1	0·6	4·0	...	0·03	67·4
September	...	0·3	...	0·03	10·3	0·2	0·9	0·1	0·4	...	0·4	2·4	1·7	2·5	...	0·2	62·2
October	0·02	0·1	...	...	14·8	0·3	0·8	0·3	0·2	...	0·3	1·7	1·8	1·8	...	0·03	67·1
November	0·1	0·8	...	...	15·8	0·3	0·8	0·4	0·1	...	1·4	1·9	0·9	0·5	...	0·03	71·0
December	...	1·4	...	0·03	6·5	0·03	1·3	0·1	0·3	...	0·8	1·4	0·3	0·03	...	...	46·9
TOTAL	1·2	11·7	0·03	0·3	72·3	2·6	20·1	3·6	6·1	0·3	5·7	24·8	6·8	25·2	...	5·3	722·2

APPENDIX

BRITISH

Table showing ratios per 1,000 of strength of admissions for certain

Station and Districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para A.	Para. B.	Para. C.	Enteric group.	Bacillary.	B. Exudato.	Protozoal.	Clinical.
Cherat	...	...	...	...	...	31·9	...	...	21·3
Landikotal	...	...	...	...	...	...	...	...	...
Nowshera	...	...	...	...	...	24·4	1·1	2·1	10·6
Peshawar	...	...	...	...	1·4	16·6	1·4	4·2	6·9
Risalpur	...	...	...	...	...	41·7	...	...	...
Total Peshawar District	...	...	...	...	0·5	22·3	1·0	2·6	9·9
Kohat	...	...	...	...	...	21·7	...	...	...
Thal	...	...	...	...	...	...	...	...	...
Total Kohat District	...	...	...	...	...	19·1	...	...	...
Abbottabad	...	...	...	...	...	21·3	...	3·5	...
Attock	...	...	...	...	...	...	35·7	...	...
Barian	...	...	...	...	...	...	...	...	8·5
Campbellpore	...	...	...	...	...	12·2	36·6	...	6·1
Gharial	...	...	...	...	...	...	...	...	...
Jhelum	...	...	...	...	...	...	...	...	...
Khanspur	...	...	...	...	...	...	...	13·3	...
Kuldana	...	...	...	...	...	...	...	...	...
Murree	...	...	...	...	...	34·9	11·6	...	11·6
Rawalpindi	...	...	...	...	0·6	18·3	2·4	...	18·3
Total Rawalpindi District	...	...	...	...	0·4	15·4	4·4	0·7	12·5
Ambala	...	...	...	...	...	4·0	8·0	...	4·0
Amritsar	...	...	...	...	...	...	...	...	...
Dagshai	...	...	...	...	...	4·9	4·9	...	...
Dalhousie	...	5·1	...	...	...	15·4	...	...	...
Ferozepore	...	6·1	...	...	1·5	...	...	...	1·5
Jullundur	3·0	...	...	...	...	3·0	6·1	6·1	...
Jutogh	...	...	...	...	...	...	...	...	...
Kasauli	...	...	...	...	...	17·1	...	8·5	...
Lahore	4·4	14·4	...	...	...	7·6	1·1	...	18·8
Multan	...	...	...	...	...	2·4	2·4	...	...
Sialkot	...	...	...	...	1·5	13·1	...	...	...
Total Lahore District	1·2	4·4	...	...	0·5	11·0	1·7	1·0	4·7
Bannu	1·6	...	...	...	1·6	83·3	9·6	9·6	27·2
Dera Ismail Khan	...	...	...	...	...	16·7	50·0	...	...
Kalabagh (Mari Indus)	...	...	...	...	...	...	...	...	...
Manzai	...	...	...	...	...	...	...	...	...
Mir Ali	...	...	...	...	...	...	...	...	...
Razmak	0·7	...	...	...	...	39·3	...	1·4	4·1
Wana	...	...	...	...	...	...	28·6	...	...
Total Waziristan District	0·9	...	...	...	0·5	50·3	3·6	2·7	10·4
Quetta	...	...	...	...	...	19·5	3·1	...	13·3
Karachi	...	...	...	...	...	19·6	6·2	...	20·7
Total Western (I.) District	...	...	...	...	...	19·6	4·6	...	17·0

VII.

OTHER RANKS.

diseases in each station and district in India for the year 1940.

Diarrhoea.	Cholera.	Venereal diseases.	Small-pox.	Malaria.	Dengue.	Sandfly fever.	Plague.	Influenza.	Pneumonia (lobar and lobular).	Heat stroke.	Heat exhaustion.	All causes.	Constantly sick.
42·6	...	21·3	...	10·6	...	16·0	...	...	5·3	...	...	617·0	13·94
37·0	...	...	...	...	...	74·1	...	...	...	...	...	370·4	6·66
90·1	...	60·4	...	80·6	1·1	35·0	...	13·8	8·5	1·1	9·5	918·3	26·85
27·7	...	36·1	...	49·9	...	106·8	...	31·9	9·7	...	2·8	904·3	36·06
20·8	...	...	...	20·8	...	20·8	...	...	...	...	...	229·1	7·92
59·7	...	45·1	...	59·7	0·5	60·2	...	18·7	8·3	0·5	5·7	858·8	28·28
72·5	...	36·2	...	29·0	...	72·5	...	...	7·2	...	...	913·0	28·26
76·9	...	...	...	153·8	...	...	...	...	...	...	...	230·8	3·85
70·1	...	31·8	...	38·2	...	63·7	...	...	6·4	...	...	821·7	25·16
46·1	...	31·9	...	31·9	...	35·5	...	21·3	14·2	...	...	666·7	20·50
...	...	71·4	...	1,142·8	...	107·1	...	...	...	...	...	1,714·3	24·64
8·5	...	153·8	...	42·7	...	51·3	...	25·6	...	...	8·5	743·6	31·62
42·7	...	12·2	...	109·8	...	30·5	...	73·2	12·2	6·1	...	591·5	13·90
8·2	...	...	...	8·2	...	...	...	...	4·1	...	...	90·2	4·59
...	...	...	...	333·3	...	...	...	...	...	...	...	333·3	3·33
...	...	...	...	53·3	...	...	...	...	...	...	...	133·3	2·40
...	...	...	...	47·6	...	47·6	...	...	...	...	...	428·6	25·71
34·9	...	23·3	...	139·5	...	58·1	...	11·6	...	...	11·6	1,535·9	221·53
21·8	...	47·2	...	145·0	0·6	63·1	...	38·9	8·3	...	11·8	873·8	36·79
23·2	...	41·6	...	121·7	0·4	50·4	...	32·4	7·7	0·4	8·1	763·9	35·22
32·9	...	100·0	...	4·0	...	64·0	...	4·0	4·0	4·0	...	688·0	32·56
...	...	14·9	...	...	...	...	...	...	14·9	...	...	492·6	16·71
34·0	...	77·7	...	58·3	...	4·9	...	...	...	...	...	665·0	25·19
30·8	...	25·6	...	87·2	...	...	...	...	10·3	...	...	712·8	45·90
15·4	...	66·1	...	189·0	1·5	63·0	...	1·5	7·7	9·2	46·1	921·7	29·90
12·1	...	18·2	...	3·0	3·0	6·1	...	9·1	9·1	...	...	497·0	17·73
...	...	...	...	...	...	...	...	...	...	...	...	125·0	3·33
17·1	...	12·8	...	38·5	...	4·3	...	4·3	4·3	...	...	594·0	23·63
24·3	...	47·5	...	47·5	4·4	14·4	...	3·3	7·7	2·2	8·8	697·2	34·09
22·0	...	82·9	2·4	536·6	...	141·5	...	...	...	17·1	36·6	1,461·0	42·98
30·7	...	59·9	...	134·3	...	33·6	...	...	1·5	1·5	...	789·8	31·39
22·3	...	53·2	0·2	127·1	1·5	38·0	...	2·2	5·2	4·2	18·0	778·3	30·59
56·1	...	3·2	1·6	101·0	...	149·0	...	12·8	1·6	...	16·0	906·6	15·64
...	...	...	...	666·7	...	16·7	...	...	16·7	...	...	933·3	24·84
...	...	...	...	...	...	...	...	...	...	...	...	400·0	16·00
...	...	...	...	200·0	...	200·0	...	...	...	...	...	600·0	10·00
...	...	33·3	...	200·0	...	66·7	...	...	...	...	...	805·0	10·00
...	...	6·8	1·4	165·5	...	37·3	...	...	2·0	...	...	634·3	29·19
26·5	...	400·0	...	57·1	...	...	...	...	28·6	...	...	257·1	5·43
...	...	...	...	...	...	...	...	...	...	...	...	...	...
33·5	...	12·2	1·4	161·2	...	68·8	...	2·7	2·7	...	4·5	721·5	24·90
22·6	...	15·4	...	83·2	...	30·0	...	3·1	7·2	...	...	745·4	38·09
28·9	...	35·1	...	49·6	3·1	15·1	...	...	1·0	...	1·0	708·7	26·25
25·7	...	25·2	...	66·4	1·5	27·3	...	1·5	4·1	...	0·5	726·7	32·17

APPENDIX
BRITISH

Stations and Districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para. A.	Para. B.	Para. C.	Enteric group.	Bacillery.	B. Exudate.	Protozoal.	Clinical.
Chakrata	...	...	...	...	...	15·9	20·5	...	6·8
Dehra Dun	...	...	...	...	...	13·5	...	...	...
Landour	...	...	...	...	...	...	...	...	71·4
Meerut	0·7	...	...	...	...	18·5	0·7	0·7	6·4
Roorkee	...	...	...	...	...	55·6	55·6	27·8	27·8
Agra	...	...	...	...	...	53·8	22·3	1·9	7·4
Delhi	...	...	...	...	...	19·0	1·4	1·4	2·7
Muttra	...	...	...	...	...	125·0	...	...	...
Total Meerut District	0·3	...	...	...	...	24·9	7·7	1·2	6·1
Bareilly	...	...	...	...	...	33·1	...	3·0	3·0
Jhansi	...	...	...	...	...	32·0	...	1·4	1·4
Allahabad	...	...	...	...	...	63·6	2·0	6·0	...
Benares	...	...	...	...	...	30·3	15·1	...	...
Cawnpore	...	...	...	...	...	4·6	3·0	3·0	10·7
Lucknow	...	...	...	...	...	11·9	4·6	2·7	8·2
Ranikhet	...	...	...	...	...	25·0	6·7	1·7	5·0
Total Lucknow District	...	...	...	...	...	24·9	3·3	2·8	5·3
Alipore	...	...	...	...	...	10·6	3·0	18·9	...
Barrackpore	...	...	...	...	...	16·2	1·8	19·7	7·2
Dinapore	...	...	...	...	...	11·0	7·3	3·7	7·3
Lebong	...	...	...	...	...	...	...	...	28·6
Port Blair	...	...	...	...	...	...	9·3	...	...
Total P. & A. District	...	...	...	...	...	11·1	3·8	14·5	3·8
Jubbulpore	...	1·0	...	...	...	34·0	3·1	...	...
Kamptee	...	...	...	...	...	42·6	...	...	...
Pachmarhi	...	...	...	...	...	27·8	...	...	...
Saugor	...	...	...	...	...	...	...	...	...
Total Jubbulpore Bde. Area	...	0·8	...	...	...	32·1	2·5	...	...
Ahmadnagar	...	...	...	...	...	7·6	...	...	...
Belgaum	...	...	...	...	...	32·3	...	...	...
Poona	...	...	...	...	...	22·8	2·5	2·5	6·8
Secunderabad	0·7	...	...	...	...	24·3	...	3·6	2·1
Total Deccan District	0·3	...	...	...	...	22·4	1·2	2·7	4·2
Ahmedabad	...	...	...	...	...	...	18·5	...	...
Bombay	...	...	...	...	...	4·0	0·8	0·8	2·4
Deolali	...	...	...	...	...	...	...	...	...
Mhow	1·3	...	...	...	1·3	8·8	...	5·0	1·3
Mount Abu	...	...	...	...	...	...	...	...	...
Nasirabad	...	...	...	...	...	...	...	...	...
Total Bombay District	0·4	...	...	...	0·4	4·9	0·8	2·0	1·6
Bangalore	4·4	...	...	...	1·5	17·5	4·4	2·9	7·3
Madras	1·1	...	...	...	...	7·4	4·2	1·1	1·1
Malapuram	...	...	...	...	...	...	...	12·8	...
Wellington	...	...	...	...	...	34·8	12·1	3·0	...
Total Madras District	1·7	...	...	...	0·4	17·7	6·3	2·5	2·5
ALL-INDIA	0·4	0·6	...	...	0·2	20·5	3·4	2·8	6·3

VII—*contd.*

OTHER RANKS—*contd.*

Diarrhœa.	Cholera.	Venereal diseases.	Small-pox.	Malaria.	Dengue.	Sandfly fever.	Plague.	Influenza.	Pneumonia (lobar and lobular).	Heat stroke.	Heat exhaustion.	All causes.	Constantly sick.
11·4	...	41·0	...	36·4	...	...	...	11·4	4·6	...	2·3	703·9	26·17
13·5	...	40·5	...	54·1	...	...	...	...	...	...	13·5	500·0	17·00
...	...	71·4	...	142·8	71·4	857·1	...	71·4	...	...	...	5,500·0	149·20
44·2	...	74·1	...	83·4	...	...	...	12·8	6·4	0·7	15·7	784·0	29·48
...	...	55·6	...	55·6	...	...	...	...	...	...	...	750·0	14·20
26·0	...	37·1	1·9	44·5	27·8	27·8	...	1·9	7·4	20·4	16·7	896·1	28·70
29·9	...	78·9	...	27·2	...	1·4	...	5·4	4·1	...	...	737·4	30·50
125·8	...	...	...	...	...	...	...	...	...	...	...	375·0	11·00
32·6	...	63·3	0·3	56·8	4·9	8·6	...	8·9	5·5	3·7	10·1	792·7	29·11
12·0	...	54·2	3·0	39·2	...	12·0	...	15·1	3·0	...	12·0	734·9	30·60
43·2	...	32·0	...	16·7	9·7	9·7	...	...	7·0	...	...	838·4	30·26
73·6	...	65·6	...	35·8	...	51·7	...	33·8	15·9	4·0	37·8	844·9	32·17
30·3	...	30·3	...	...	...	287·9	...	15·1	...	...	...	1151·5	33·90
22·8	...	149·2	...	45·7	...	50·2	...	...	4·6	3·0	1·5	869·1	39·07
19·2	...	46·7	2·7	9·2	2·7	27·5	...	8·2	4·6	...	...	631·9	33·44
20·0	...	23·3	...	31·7	...	1·7	...	6·7	...	...	...	398·3	32·85
30·7	...	60·2	1·0	25·7	2·5	30·2	...	9·1	5·5	1·0	6·0	717·5	33·32
7·5	...	92·8	...	30·9	65·7	...	...	...	3·8	...	...	598·5	28·60
3·6	1·8	105·9	...	43·1	48·5	...	...	...	1·8	...	3·6	558·3	45·73
12·8	...	89·6	...	118·8	12·8	3·7	...	12·8	1·8	3·7	1·8	760·5	22·03
...	...	42·9	...	...	...	...	...	...	...	...	...	371·4	56·27
...	...	9·3	...	9·3	...	...	...	...	...	...	...	158·9	3·46
7·3	0·4	90·0	...	50·2	46·3	0·8	...	2·7	2·7	0·8	1·1	598·4	30·14
18·5	...	83·4	...	117·4	2·1	14·4	...	...	5·1	1·0	...	808·4	33·58
31·9	...	63·8	...	21·3	...	...	...	...	10·6	...	...	244·6	8·72
...	...	...	...	166·7	...	...	...	...	27·8	...	...	261·1	6·38
23·8	...	23·8	...	190·4	...	...	...	59·5	...	...	...	464·2	7·38
19·4	...	75·1	...	116·5	1·7	11·8	...	4·2	5·9	0·8	...	725·7	28·93
7·6	...	103·1	...	45·8	...	19·1	...	...	...	...	...	473·3	12·37
...	...	80·6	...	32·3	...	...	...	...	...	...	...	338·7	74·03
11·1	...	84·6	...	98·1	...	...	...	26·5	6·2	...	...	677·8	38·92
20·0	...	62·1	1·4	20·7	8·6	13·6	...	39·3	2·1	...	...	670·0	28·11
14·4	...	76·6	0·6	60·4	3·6	7·2	...	29·2	3·9	...	...	652·2	32·97
...	...	...	...	92·6	...	...	...	...	...	...	...	463·0	7·04
24·1	...	105·2	...	28·9	1·6	0·8	...	28·9	35·3	...	0·8	881·9	30·39
17·4	...	66·2	...	111·5	...	3·5	...	...	3·5	...	...	676·0	30·14
15·1	...	44·0	1·3	52·8	11·3	17·6	...	1·3	2·5	...	1·8	542·7	28·20
81·1	...	27·0	...	81·1	...	27·0	...	...	...	...	...	756·7	24·05
...	...	26·3	...	...	...	...	...	...	...	...	...	26·3	0·79
20·4	...	76·1	0·4	48·0	4·5	6·9	...	15·1	19·1	...	0·8	723·6	28·58
...	...	...	...	10·2	2·9	...	...	...	1·5	...	...	560·4	55·15
16·0	...	83·0	..	13·7	35·9	...	...	13·7	1·1	1·1	...	616·7	20·14
16·9	...	57·0	...	...	...	...	...	...	...	...	...	769·2	14·10
25·6	...	192·3	...	15·2	...	...	...	33·3	4·5	...	...	575·8	24·21
3·0	...	53·0	...	12·6	15·2	...	...	14·8	2·1	5·4	...	172·4	33·61
13·1	...	67·9	...	73·4	6·8	25·7	...	12·1	6·0	1·2	4·9	723·3	30·97
25·0	0·0	58·1	0·4										

APPENDIX VIII.

BRITISH OTHER RANKS.

Table showing admission and death ratios per 1,000 of strength by Commands contrasted with the previous year and the average for the previous five years.

Commands.		Enteric Group of fevers.		Influenza.		Cholera.		Small-pox.		Malaria.		Dysentery.		Pyrexia of uncertain origin.		Pneumonia, lobar and lobular.		Venereal diseases.		Dengue.		Sandfly fever.		Plague.	
		A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A:	D.
Northern	1935-39	1·6	0·13	9·9	...	...	...	0·1	0·03	60·5	0·04	22·1	0·05	0·4	...	4·8	0·32	31·9	0·01	0·2	...	63·3	...	...	...
	1939	1·5	0·08	9·6	...	...	...	0·1	...	67·4	0·08	18·9	0·16	0·2	...	6·7	0·16	37·0	0·08	0·6	...	52·4	...	...	...
	1940	2·7	...	12·5	...	...	...	0·4	...	119·3	...	34·6	0·09	0·3	...	5·8	...	40·4	...	0·7	...	51·3	...	...	...
Western District. (I.)	1935-39	0·4	...	5·6	...	...	...	...	....	102·2	0·42	33·7	...	0·1	...	3·2	0·12	42·1	...	1·7	...	22·5	...	...	...
	1939	0·5	...	6·0	...	...	...	...	...	69·2	0·42	21·5	...	0·9	...	2·7	...	61·4	...	1·8	...	32·5	...	...	...
	1940	...	...	1·5	...	...	...	...	...	66·4	...	41·2	0·51	4·6	...	4·1	...	25·2	...	1·5	...	27·3	...	...	...
Eastern	1935-39	1·5	0·11	17·6	...	0·1	...	0·2	...	34·3	0·04	30·4	0·04	0·1		3·7	0·41	46·9	...	14·0	...	19·9	...	...	...
	1939	0·9	0·09	8·1	...	...	...	0·3	...	31·8	...	37·2	...	...	...	3·8	0·19	54·1	...	27·0	...	31·6	...	...	...
	1940	0·1	...	7·3	...	0·1	0·10	0·5	...	42·5	...	36·7	...	0·2	...	4·8	0·10	69·1	...	14·9	...	15·3	...	...	...
Southern	1935-39	0·7	0·05	11·2	...	...	...	0·05	...	50·9	0·05	26·4	...	0·3	...	3·0	0·18	43·7	...	6·5	...	7·0	...	...	...
	1939	1·0	...	11·2	...	...	...	...	...	61·6	0·10	33·9	...	0·2	...	3·3	...	64·6	...	4·3	...	3·4	...	...	...
	1940	1·0	...	18·9	...	...	...	0·3	0·11	54·9	...	25·4	...	...	...	7·8	0·11	74·8	...	6·6	...	5·9	...	...	...
All India	1935-39	1·3	0·10	9·5	...	0·04	0·00	0·1	0·01	52·9	0·07	26·9	0·03	0·3	...	3·8	0·29	41·3	0·00	6·9	...	30·4	...	...	...
	1939	1·1	0·08	9·4	...	...	...	0·1	...	55·1	0·11	28·9	0·03	0·2	...	4·6	0·11	52·1	...	9·6	...	30·7	...	...	...
	1940	1·2	...	12·1	...	0·03	0·03	0·4	0·03	73·4	...	33·0	0·06	0·4	...	6·0	0·06	58·1	...	6·8	...	25·7	...		

APPENDIX IX.

BRITISH OFFICERS (BRITISH SERVICE).

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick during the year 1940.

Diseases.	Admissions.	Deaths.	Constantly sick.
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.			
Common cold	8·9	..	0·15
Diphtheria	4·9	..	0·41
Dysentery	47·6	0·49	1·81
Enteric fevers (inclusive of typhoid. Para. A. B. and C. and enteric group).	1·5	..	0·08
Erysipelas	0·9	..	0·06
Influenza	9·9	..	0·23
Malaria	44·6	..	1·51
Measles	1·5	..	0·04
Meningococcal infection	..	..	..
Mumps	9·9	..	0·05
Pneumonia	2·9	0·99	0·16
Pyrexia of uncertain origin	0·5	..	0·00
Rheumatic fever	0·9	..	0·16
Sandfly fever	21·8	..	0·47
Scarlet fever	1·5	..	0·01
Small-pox	..	..	..
Tuberculosis — Pulmonary	1·9	..	0·72
Tuberculosis — Other	..	..	..
Venereal Diseases — Gonorrhoea	..	..	..
Venereal Diseases — Soft chancre	..	..	..
Venereal Diseases — Syphilis	..	..	..
Venereal Diseases — Other V. D.	..	..	..
Other diseases due to infection	12·8	..	0·99
Diseases due to infestation by metazoan parasites — Scabies	..	..	..
Diseases due to infestation by metazoan parasites — Other diseases	9·9	..	0·01
OTHER DISEASES CLASSIFIED UNDER SYSTEMS.			
Diseases of the nervous system	14·4	0·49	0·62
Mental diseases	3·9	..	0·43
Diseases of the—			
Eye	5·4	..	0·35
Ear and nose	24·7	..	0·47
Circulatory system — Valvular disease of the heart	..	..	..
Circulatory system — Disordered action of the heart	2·9	..	0·13
Circulatory system — Other diseases	2·9	..	0·64
Blood and blood forming organs	3·5	..	0·08
Ductless or endocrine glands	..	..	..
Breast	..	..	..
Respiratory system — Larynx and trachea	1·5	..	0·08
Respiratory system — Bronchi and bronchioles	12·4	..	0·36
Respiratory system — Other diseases	2·9	..	0·15
Teeth and gums	1·5	..	0·02
Digestive system — Inflammation of tonsils	26·8	..	0·61
Digestive system — Inflammation of pharynx	17·8	..	0·25
Digestive system — Inflammation of stomach	5·9	..	0·24
Digestive system — Gastric ulcer	0·5	..	0·09
Digestive system — Duodenal ulcer	..	..	..
Digestive system — Liver	26·3	..	1·23
Digestive system — Other diseases	84·8	..	2·25
Diseases due to disorders of nutrition or of metabolism.	1·9	..	0·03

Diseases.	Admissions.	Deaths.	Constantly sick.
Diseases of the—			
Generative system	..	..	..
Bones, joints, muscles, fasciae and bursae	13·4	..	0·75
Areolar tissues	30·2	..	0·82
Skin	12·3	..	0·40
Urinary organs	8·4	..	0·59
Injuries — General	4·5	0·49	0·11
Injuries — Local	51·1	0·99	2·42
Injuries — In action	1·5	0·49	0·09
Tumours and cysts	1·9	0·99	0·11
Poisons	0·5	..	0·00
No appreciable disease	4·5	..	0·21
*Suicides	..	0·49	..
TOTAL	533·5	4·96	20·34

* The figures against "Suicide" having already been shown under the heading of the injury, etc. which caused deaths, are not included in the total.

APPENDIX X.

WIVES OF WARRANT OFFICERS, N. C. O.'S AND MEN.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick during the year 1940.

Diseases.	Admissions.	Deaths.	Constantly sick.
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.			
Common cold	4·3	..	0·08
Diphtheria	1·3	..	0·13
Dysentery	12·7	..	0·42
Enteric fevers (inclusive of typhoid, Para. A, B and C and enteric group).	0·3	..	0·03
Erysipelas	0·3	..	0·01
Influenza	4·7	..	0·08
Malaria	33·4	..	0·97
Measles	0·3	..	0·01
Meningococcal infection	..	..	..
Mumps	..	..	..
Pneumonia	4·0	..	0·29
Pyrexia of uncertain origin	..	..	..
Rheumatic fever	0·7	..	0·03
Sandfly fever	2·7	..	0·05
Scarlet fever	..	..	..
Small-pox	0·7	0·33	0·03
Tuberculosis — Pulmonary	0·7	..	0·96
Tuberculosis — Other	..	..	..
Venereal Diseases — Gonorrhoea	0·3	..	0·01
Venereal Diseases — Soft chancre	..	..	..
Venereal Diseases — Syphilis	..	..	..
Venereal Diseases — Other V. D.	..	..	..
Other diseases due to infection	2·7	..	0·08
Diseases due to infestation by metazoan parasites — Scabies	..	..	..
Diseases due to infestation by metazoan parasites — Other diseases	5·7	..	0·08
OTHER DISEASES CLASSIFIED UNDER SYSTEMS.			
Diseases of the nervous system	5·7	0·67	0·22
Mental diseases	5·3	..	0·56
Diseases of the—			
Eye	3·3	..	0·18
Ear and nose	11·0	..	0·19
Circulatory system — Valvular disease of the heart	..	..	..
Circulatory system — Disordered action of the heart	4·0	..	0·25
Circulatory system — Other diseases	3·3	..	0·14
Blood and blood forming organs	3·3	..	0·14
Ductless or endocrine glands	1·3	..	0·06
Breast	0·7	..	0·01
Respiratory system — Larynx and trachea	..	..	..
Respiratory system — Bronchi and bronchioles	8·3	..	0·19
Respiratory system — Other diseases	2·7	..	0·14
Teeth and gums	2·0	..	0·02
Digestive system — Inflammation of tonsils	13·7	..	0·21
Digestive system — Inflammation of pharynx	2·0	..	0·02
Digestive system — Inflammation of stomach	5·0	..	0·09
Digestive system — Gastric ulcer	0·3	..	0·02
Digestive system — Duodenal ulcer	..	..	..
Digestive system — Liver	4·7	..	0·19
Digestive system — Other diseases	40·7	..	1·30
Diseases due to disorders of nutrition or of metabolism.	0·3	..	0·01

Diseases.	Admissions.	Deaths.	Constantly sick.
Diseases of the—			
Generative system	95·5	1·00	3·57
Bones, joints, muscles, fasciae and bursae	6·3	..	0·16
Areolar tissues	12·4	..	0·25
Skin	4·0	..	0·09
Urinary organs	17·4	..	0·68
Injuries — General	0·3	..	0·01
Injuries — Local	8·3	..	0·21
Injuries — In action	..	..	..
Tumours and cysts	4·0	0·33	0·22
Poisons	0·3	0·33	0·00
No appreciable disease	7·7	..	0·14
*Suicides	..	0·33	..
TOTAL	348·9	2·67	11·69

* The figures against "Suicide" having already been shown under the heading of the injury, etc. which caused deaths, are not included in the total.

APPENDIX XI.

BRITISH OTHER RANKS (CHILDREN.)

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths and constantly sick during the year 1940.

Diseases.	Admissions.	Deaths.	Constantly sick.
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.			
Common cold	9·5	..	0·14
Diphtheria	6·5	0·49	0·57
Dysentery	39·1	2·43	1·44
Enteric fevers (inclusive of typhoid, Para. A, B and C and enteric group).	0·7	..	0·11
Erysipelas	..	..	..
Influenza	4·1	..	0·06
Malaria	25·5	..	0·81
Measles	9·5	0·24	0·25
Meningococcal infection	..	..	..
Mumps	0·5	..	0·02
Pneumonia	8·7	1·70	0·32
Pyrexia of uncertain origin	..	..	..
Rheumatic fever	7·3	..	0·16
Sandfly fever	2·7	..	0·04
Scarlet fever	1·9	0·24	0·10
Small-pox	0·2	..	0·01
Tuberculosis — Pulmonary	..	..	..
Tuberculosis — Other	1·4	0·24	0·13
Venereal Diseases — Gonorrhoea	..	..	..
Venereal Diseases — Soft chancre	..	..	..
Venereal Diseases — Syphilis	..	..	..
Venereal Diseases — Other V. D.	..	..	..
Other diseases due to infection	4·8	0·73	0·23
Diseases due to infestation by metazoan parasites — Scabies	0·5	..	0·04
Diseases due to infestation by metazoan parasites — Other diseases	4·8	..	0·10
OTHER DISEASES CLASSIFIED UNDER SYSTEMS.			
Diseases of the nervous system	4·6	1·46	0·14
Mental diseases	..	..	..
Diseases of the—			
Eye	6·3	..	0·18
Ear and nose	14·3	..	0·34
Circulatory system — Valvular disease of the heart	0·5	0·24	0·02
Circulatory system — Disordered action of the heart	0·2	0·24	0·00
Circulatory system — Other diseases	0·2	..	0·04
Blood and blood forming organs	4·1	..	0·09
Ductless or endocrine glands	0·2	..	0·00
Breast	..	..	..
Respiratory system — Larynx and trachea	0·9	..	0·01
Respiratory system — Bronchi and bronchioles	32·8	..	0·89
Respiratory system — Other diseases	0·7	..	0·06
Teeth and gums	4·6	..	0·05
Digestive system — Inflammation of tonsils	38·6	..	0·95
Digestive system — Inflammation of pharynx	1·9	..	0·03
Digestive system — Inflammation of stomach	3·4	..	0·08
Digestive system — Gastric ulcer	0·2	..	0·02
Digestive system — Duodenal ulcer	..	..	..
Digestive system — Liver	5·3	..	0·15
Digestive system — Other diseases	75·1	2·67	1·68
Diseases due to disorders of nutrition or of metabolism.	7·5	1·70	0·36

Diseases.	Admissions.	Deaths.	Constantly sick.
Diseases of the—			
Generative system	7·8	0·97	0·28
Bones, joints, muscles, fasciae and bursae	0·5	..	0·06
Areolar tissues	13·6	..	0·27
Skin	3·1	..	0·09
Urinary organs	5·1	0·24	0·18
Injuries — General	0·7	0·24	0·01
Injuries — Local	13·8	0·49	0·47
Injuries — In action	..	..	..
Tumours and cysts	0·9	0·24	0·03
Poisons	..	..	..
No appreciable disease	5·8	0·24	0·21
*Suicides	..	..	..
TOTAL	374·9	14·82	11·19

* The figures against "Suicide" having already been shown under the heading of the injury, etc. which caused deaths, are not included in the total.

APPENDIX XII (*i*).

VACCINATION PERFORMED IN THE BRITISH AND INDIAN ARMIES DURING 1940—OFFICERS AND OTHER RANKS.

Commands.	British Troops.							
	Officers.				Warrant, and N. C. Officers and men.			
	Number.		Percentage of successful cases to total operations.		Number.		Percentage of successful cases to total operations.	
	P.	R.	P.	R.	P.	R.	P.	R.
Northern	21	237	100	81	548	5,049	98	95
Western	...	47	...	92	15	369	100	93
Eastern	14	237	85	85	253	4,671	79	80
Southern	23	264	100	71	388	5,675	84	56
Total	58	785	97	79	1,204	15,764	91	76

Commands.	Indian Troops.											
	King's Commissioned Officers.				V. C. Os., Non-Commissioned Officers and men.				Non-Combatants.			
	Number.		Percentage of successful cases to total operations.		Number.		Percentage of successful cases to total operations.		Number.		Percentage of successful cases to total operations.	
	P.	R.	P.	R.	P.	R.	P.	R.	P.	R.	P.	R.
Northern	4	438	...	94	6,667	55,574	99	95	268	11,849	94	95
Western	16	64	100	86	661	5,499	100	81	94	953	100	80
Eastern	1	193	100	55	6,157	32,354	84	71	1,441	4,431	16	68
Southern	19	378	100	76	1,362	38,071	71	80	232	6,261	75	80
Total	40	1,073	90	80	14,847	1,31,498	90	84	2,035	23,494	37	86

P.—Primary. R.—Revaccination.

APPENDIX XII (*iii*).

VACCINATION PERFORMED IN THE FAMILIES—BRITISH ARMY DURING 1940.

Commands.	Women.				Children.			
	Number.		Percentage of successful cases to total operations.		Number.		Percentage of successful cases to total operations.	
	P.	R.	P.	R.	P.	R.	P.	R.
Northern	12	378	100	91	19	433	100	94
Western	1	142	100	98	26	108	100	97
Eastern	17	306	88	89	123	283	96	89
Southern	22	715	95	77	165	890	93	73
Total	52	1,541	94	84	463	1,709	97	82

P.—Primary. R.—Revaccination.

APPENDIX XII (*iii*).

VACCINATION PERFORMED IN THE FAMILIES—INDIAN ARMY DURING 1940.

Commands.	Women.				Children.			
	Number.		Percentage of successful cases to total operations.		Number.		Percentage of successful cases to total operations.	
	P.	R.	P.	R.	P.	R.	P.	R.
Northern	4	129	...	95	39	75	90	87
Western	...	37	...	97	14	18	100	89
Eastern	5	37	100	59	20	49	95	71
Southern	8	173	100	91	16	184	100	94
Total	17	376	76	90	89	326	94	89

P.—Primary. R.—Revaccination.

APPENDIX XIII.

V. C. OS. AND INDIAN OTHER RANKS.

ALL INDIA.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths numbers invalided and constantly sick during the year 1940.

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
SPECIFIC DISEASES DUE TO INFECTION OR INFESTATION.				
Common cold	24·7	..	..	0·40
Diphtheria	0·0	..	..	0·00
Dysentery	22·3	0·02	0·01	0·73
Enteric fevers (inclusive of typhoid, Para. A. B. and C. and enteric group)	0·7	0·05	..	0·10
Erysipelas	0·0	..	..	0·00
Influenza	5·1	..	..	0·09
Malaria	173·2	0·09	0·08	3·72
Measles	1·0	..	..	0·04
Meningococcal infection	0·6	0·10	..	0·03
Mumps	9·3	..	..	0·37
Pneumonia	8·3	0·29	0·01	0·48
Pyrexia of uncertain origin	0·1	0·03	..	0·01
Rheumatic fever	0·9	..	0·03	0·05
Sandfly fever	5·9	..	..	0·11
Scarlet fever	..	..	..	..
Small-pox	0·1	0·02	..	0·01
Tuberculosis — Pulmonary	2·2	0·11	2·02	0·28
Tuberculosis — Other	0·4	0·01	0·28	0·05
Venereal Diseases — Gonorrhoea	7·5	..	5·03	0·51
Venereal Diseases — Soft chancre	1·4	..	..	0·10
Venereal Diseases — Syphilis	6·1	0·01	0·08	0·53
Venereal Diseases — Other V. D.	3·9	..	0·01	0·22
Other diseases due to infection	3·6	0·07	0·16	0·27
Diseases due to infestation by metazoan parasites. — Scabies	16·8	..	..	0·50
Diseases due to infestation by metazoan parasites. — Other diseases.	10·4	0·01	0·05	0·41
OTHER DISEASES CLASSIFIED UNDER SYSTEMS.				
Diseases of the nervous system	5·2	0·03	0·96	0·28
Mental diseases	1·9	0·01	0·81	0·18
Diseases of the—				
Eye	13·8	..	0·97	0·51
Ear and nose	11·2	0·01	0·35	0·30
Circulatory system. — Valvular disease of the heart	0·2	..	0·16	0·02
Circulatory system. — Disordered action of the heart	0·7	0·03	0·15	0·04
Circulatory system. — Other diseases	0·9	0·06	0·25	0·06
Blood and blood forming organs	5·0	0·03	0·21	0·29
Ductless or endocrine glands	0·1	0·01	0·04	0·01
Breast	0·0	..	..	0·00
Respiratory system — Larnyx and trachea	0·8	0·01	..	0·03
Respiratory system — Bronchi and bronchioles	16·6	0·01	0·62	0·52
Respiratory system — Other diseases	2·2	0·01	0·18	0·20
Teeth and gums	3·1	0·01	0·33	0·08
Digestive system — Inflammation of tonsils	5·0	..	0·01	0·12
Digestive system — Inflammation of pharynx	17·5	..	..	0·31
Digestive system — Inflammation of stomach	1·2	..	0·02	0·04
Digestive system — Gastric ulcer	0·1	0·01	0·01	0·01
Digestive system — Duodenal ulcer	0·1	0·01	0·07	0·01
Digestive system — Liver	4·9	0·01	0·02	0·26
Digestive system — Other diseases	32·5	0·10	0·54	0·92
Diseases due to disorders of nutrition or of metabolism	0·3	0·01	0·06	0·01

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Diseases of the—				
Generative system	4·9	0·01	0·09	0·18
Bones, joints, muscles, fasciae and bursae	11·8	0·01	1·04	0·48
Areolar tissues	34·0	0·01	0·03	1·02
Skin	16·0	0·01	0·16	0·56
Urinary organs	3·3	0·02	0·18	0·15
Injuries—General	0·7	0·10	0·01	0·02
Injuries—Local	44·7	0·33	1·49	1·67
Injuries—In action	1·1	0·43	0·08	0·10
Tumours and cysts	1·4	0·03	0·13	0·06
Poisons	0·2	0·04	..	0·01
No appreciable disease	2·8	..	0·05	0·09
*Suicide	0·02	0·03	..	0·00
Total	549·0	2·11	11·86	17·51

*The figures against "Suicide" having already been shown under the heading of the injury, etc. which caused deaths, are not included in the total.

APPENDIX XIV.

V. C. OS. AND INDIAN OTHER RANKS—NORTHERN COMMAND,

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick during the year 1940.

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Specific diseases due to infection or infestation.				
Common cold	14·2	..	..	0·22
Diptheria	0·0	..	..	0·00
Dysentery	21·7	0·04	0·01	0·64
Enteric fevers (inclusive of typhoid, Para. A, B and C and enteric group)	1·0	0·03	..	0·12
Erysipelas	0·0	..	..	0·00
Influenza	3·1	..	..	0·06
Malaria	211·0	0·05	0·12	3·90
Measles	0·4	..	..	0·02
Meningococcal infection	0·7	0·11	..	0·03
Mumps	11·7	..	..	0·39
Pneumonia	9·5	0·19	0·01	0·56
Pyrexia of uncertain origin	0·1	0·05	..	0·01
Rheumatic fever	0·9	..	0·04	0·05
Sandfly fever	11·4	..	..	0·20
Scarlet fever	..	..	..	..
Small-pox	0·1	0·01	..	0·01
Tuberculosis — Pulmonary	2·7	0·12	2·45	0·32
Tuberculosis — Other	0·5	0·01	0·34	0·06
Venereal Diseases — Gonorrhoea	4·9	..	..	0·28
Venereal Diseases — Soft chancre	0·6	..	..	0·04
Venereal Diseases — Syphilis	2·7	..	0·02	0·25
Venereal Diseases — Other V. D.	2·1	..	..	0·13
Other diseases due to infection	1·8	0·08	0·08	0·15
Diseases due to infestation by metazoan parasites — Scabies	15·6	..	..	0·48
Diseases due to infestation by metazoan parasites — Other diseases	11·6	0·01	0·01	0·40
Other diseases classified under systems.				
Diseases of the nervous system,	4·3	0·04	0·89	0·25
Mental diseases	1·9	0·01	0·93	0·21
Diseases of the—				
Eye	12·1	..	1·33	0·44
Ear and nose	8·6	..	0·43	0·25
Circulatory system — Valvular disease of the heart	0·2	..	0·21	0·01
Circulatory system — Disordered action of the heart	0·6	0·05	0·21	0·04
Circulatory system — Other diseases	0·8	0·07	0·35	0·06
Blood and blood forming organs	5·1	0·02	0·23	0·27
Ductless or endocrine glands	0·2	..	0·06	0·01
Breast	0·0	..	..	0·00
Respiratory system — Larynx and trachea	1·0	..	..	0·03
Respiratory system — Bronchi and bronchioles	16·2	0·01	0·72	0·48
Respiratory system — Other diseases	2·6	0·01	0·17	0·25
Teeth and gums	2·6	..	0·46	0·07
Digestive system — Inflammation of tonsils	5·6	..	0·01	0·14
Digestive system — Inflammation of pharynx	22·2	..	..	0·40
Digestive system — Inflammation of stomach	0·8	..	0·04	0·03
Digestive system — Gastric ulcer	0·0	..	..	0·00
Digestive system — Duodenal ulcer	0·0	0·01	0·02	0·00
Digestive system — Liver	5·3	0·02	..	0·27
Digestive system — Other diseases	30·1	0·10	0·58	0·83
Diseases due to disorders of nutrition or of metabolism	0·2	..	0·07	0·02

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Diseases of the—				
Generative system	3·8	0·01	0·10	0·14
Bones, joints, muscles, fasciae and bursae	9·8	0·01	0·91	0·42
Areolar tissues	30·3	0·01	0·02	0·94
Skin	14·2	0·01	0·14	0·51
Urinary organs	3·6	0·04	0·16	0·16
Injuries — General	0·9	0·10	0·01	0·01
Injuries — Local	43·0	0·29	1·30	1·63
Injuries — In action	2·3	0·91	0·17	0·22
Tumours and cysts	1·1	0·02	0·11	0·05
Poisons	0·3	0·05	..	0·01
No appreciable disease	2·5	..	0·07	0·09
*Suicides	0·04	0·02	..	0·00
Total	559·5	2·56	12·94	16·56

*The figures against "Suicide" having already been shown under the heading of the injury, etc. which caused deaths, are not included in the total.

APPENDIX XV.

V. C. OS. AND INDIAN OTHER RANKS.

WESTERN (I) DISTRICT.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick during the year 1940.

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Specific diseases due to infection or infestation.				
Common cold	20·2	..	..	0·35
Diphtheria	..	..	..	..
Dysentry	13·7	..	..	0·53
Enteric fevers (inclusive of typhoid, Para. A, B. and C and enteric group)	0·4	..	..	0·07
Erysipelas	..	..	..	..
Influenza	0·7	..	..	0·01
Malaria	164·3	0·06	..	5·54
Measles	0·4	..	..	0·01
Meningococcal infection	0·3	0·12	..	0·01
Mumps	5·1	..	..	0·28
Pneumonia	5·8	0·37	..	0·36
Pyrexia of uncertain origin	..	..	..	..
Rheumatic fever	0·7	..	..	0·04
Sandfly fever	1·1	..	..	0·02
Scarlet fever	..	..	..	..
Small-pox	0·1	..	..	0·00
Tuberculosis — Pulmonary	1·5	0·06	1·31	0·17
Tuberculosis — Other	0·1	..	0·12	0·01
Venereal Diseases — Gonorrhoea	6·9	..	..	0·48
Venereal Diseases — Soft chancre	1·1	..	..	0·12
Venereal Diseases — Syphilis	4·2	0·06	..	0·35
Venereal Diseases — Other V. D.	3·9	..	..	0·22
Other diseases due to infection	1·9	0·06	0·06	0·13
Diseases due to infestation by metazoan parasites — Scabies	12·4	..	..	0·33
Diseases due to infestation by metazoan parasites — Other diseases	9·2	..	..	0·45
Other diseases classified under systems.				
Diseases of the nervous system	4·9	..	0·44	0·30
Mental diseases	1·4	..	0·37	0·12
Diseases of the—				
Eye	10·9	..	0·19	0·37
Ear and nose	3·8	..	0·37	0·12
Circulatory system — Valvular disease of the heart	..	..	..	..
Circulatory system — Disordered action of the heart	0·3	..	0·12	0·02
Circulatory system — Other diseases	0·3	0·06	..	0·01
Blood and blood forming organs	4·1	0·06	0·25	0·25
Ductless or endocrine glands	..	..	..	..
Breast	0·1	..	..	0·00
Respiratory system — Larynx and trachea	0·9	..	..	0·02
Respiratory system — Bronchi and bronchioles	16·7	..	0·19	0·54
Respiratory system — Other diseases	2·1	..	0·06	0·19
Teeth gums	1·7	..	0·12	0·08
Digestive system — Inflammation of tonsils	2·9	..	..	0·05
Digestive system — Inflammation of pharynx	19·2	..	..	0·28
Digestive system — Inflammation of stomach	1·1	..	..	0·03
Digestive system — Gastric ulcer	..	..	..	..
Digestive system — Duodenal ulcer	..	..	..	0·00
Digestive system — Liver	5·2	..	..	0·28
Digestive system — Other diseases	32·3	0·12	0·37	0·82
Diseases due to disorders of nutrition or of metabolism	0·4	..	0·06	0·01

Diseases.	Admissions.	Deaths.	Invalids	Constantly sick.
Diseases of the—				
Generative system	3·4	..	0·06	0·11
Bones, joints, muscles, fasciae and bursae	9·5	..	0·50	0·37
Areolar tissues	16·0	..	0·06	0·41
Skin	10·8	..	..	0·35
Urinary organs	2·6	0·06	0·12	0·14
Injuries — General	...	0·06	..	..
Injuries — Local	32·3	0·50	0·87	1·27
Injuries — In action	..	..	..	..
Tumours and cysts	1·4	..	0·06	0·05
Poisons	0·3	0·12	..	0·00
No appreciable disease	1·7	..	..	0·06
*Suicides	..	0·19	..	..
Total	440·0	1·75	5·74	15·72

*The figures against "Suicide" having already been shown under the heading of the injury, etc. which caused deaths, are not included in the total.

APPENDIX XVI.

V. C. OS. AND INDIAN OTHER RANKS.

EASTERN COMMAND.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick during the year 1940.

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Specific diseases due to infection or infestation.				
Common cold	52·3	..	..	0·90
Diphtheria	0·0	..	..	0·00
Dysentery	24·7	..	..	0·90
Enteric fevers (inclusive of typhoid, Para. A, B and C and enteric group)	0·5	0·03	..	0·09
Erysipelas	0·0	..	..	0·00
Influenza	10·2	..	..	0·20
Malaria	143·3	0·13	0·10	3·62
Measles	3·5	..	..	0·13
Meningococcal infection	0·8	0·10	..	0·03
Mumps	10·8	..	..	0·52
Pneumonia	9·4	0·51	..	0·52
Pyrexia of uncertain origin	0·1	..	..	0·01
Rheumatic fever	0·7	..	..	0·05
Sandfly fever	0·2	..	..	0·01
Scarlet fever	..	..	..	..
Small-pox	0·2	0·05	..	0·02
Tuberculosis — Pulmonary	1·9	0·20	1·89	0·31
Tuberculosis — Other	0·5	..	0·36	0·07
Venereal Diseases — Gonorrhoea	8·0	..	0·05	0·63
Venereal Diseases — Soft chancre	1·2	..	..	0·10
Venereal Diseases — Syphilis	5·6	..	0·03	0·46
Venereal Diseases — Other V. D.	3·4	..	..	0·12
Other diseases due to infection	6·5	0·13	0·23	0·47
Diseases due to infestation by metazoan parasites — Scabies	16·9	..	..	0·51
Diseases due to infestation by metazoan parasites — Other diseases	11·0	..	0·15	0·51
Other diseases classified under systems.				
Diseases of the nervous system	4·6	0·03	0·94	0·27
Mental diseases	2·0	..	0·79	0·17
Diseases of the—				
Eye	17·9	..	0·74	0·67
Ear and nose	10·7	0·03	0·23	0·29
Circulatory system — Valvular disease of the heart	0·3	..	0·15	0·02
Circulatory system — Disordered action of the heart	0·8	0·05	0·10	0·04
Circulatory system — Other diseases	1·0	0·08	0·13	0·05
Blood and blood forming organs	4·9	0·03	0·08	0·27
Ductless or endocrine glands	0·2	..	0·05	0·07
Breast	0·0	..	..	0·00
Respiratory system — Larynx and trachea	0·8	..	..	0·02
Respiratory system — Bronchi and bronchioles	14·6	..	0·43	0·53
Respiratory system — Other diseases	1·7	0·03	0·25	0·15
Teeth and gums	2·9	0·03	0·28	0·07
Digestive system — Inflammation of tonsils	5·1	..	..	0·11
Digestive system — Inflammation of pharynx	11·8	..	..	0·20
Digestive system — Inflammation of stomach	1·0	..	0·03	0·04
Digestive system — Gastric Ulcer	0·1	..	..	0·00
Digestive system — Duodenal ulcer	0·2	..	0·13	0·02
Digestive system — Liver	4·4	..	0·03	0·28
Digestive system — Other diseases	33·9	0·10	0·48	1·04
Diseases due to disorders of nutrition or of metabolism	0·3	0·03	0·03	0·02

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Diseases of the—				
Generative system	4·7	..	0·08	0·19
Bones, joints, muscles, fasciae and bursae	12·4	..	1·43	0·56
Areolar tissues	41·9	..	0·15	1·38
Skin	17·2	..	0·05	0·71
Urinary organs	3·3	..	0·18	0·15
Injuries — General	0·7	0·08	..	0·02
Injuries — Local	49·0	0·36	1·84	1·94
Injuries — In action	..	..	..	..
Tumours and cysts	1·6	0·05	0·20	0·07
Poisons	0·2	0·03	..	0·01
No appreciable disease	3·8	..	0·03	0·12
*Suicides	..	..	..	..
Total	566·0	2·04	11·65	19·66

*The figures against " Suicide " having already been shown under the heading of the injuries, etc. which caused deaths, are not included in the total.

APPENDIX XVII.

V. C. OFFICERS AND INDIAN OTHER RANKS.

SOUTHERN COMMAND.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick during the year 1940.

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Specific diseases due to infection or infestation.				
Common cold	20·7	..	..	0·29
Diphtheria	0·0	..	..	0·00
Dysentery	25·1	..	..	0·85
Enteric fevers (inclusive of typhoid, Para. A, B and C and enteric group)	0·6	0·03	..	0·08
Erysipelas	0·0	..	..	0·00
Influenza	6·4	..	..	0·10
Malaria	125·9	0·17	..	2·57
Measles	0·2	..	..	0·01
Meningococcal infection	0·2	0·06	..	0·01
Mumps	3·9	..	..	0·20
Pneumonia	5·2	0·22	..	0·31
Pyrexia of uncertain origin	0·1	0·03	..	0·00
Rheumatic fever	1·3	..	0·08	0·07
Sandfly fever	1·6	..	..	0·03
Scarlet fever	..	..	..	..
Small-pox	0·3	..	..	0·02
Tuberculosis — Pulmonary	1·7	..	1·50	0·18
Tuberculosis — Other	0·2	..	0·11	0·02
Venereal Diseases — Gonorrhoea	13·4	..	0·08	0·91
Venereal Diseases — Soft chancre	3·4	..	..	0·22
Venereal Diseases — Syphilis	15·6	..	0·31	1·31
Venereal Diseases — Other V. D.	8·5	..	0·03	0·46
Other diseases due to infection	5·3	..	0·25	0·45
Diseases due to infestation by metazoan parasites — Scabies	21·6	..	..	0·61
Diseases due to infestation by metazoan parasites — Other diseases	7·6	..	0·06	0·29
Other diseases classified under systems.				
Diseases of the nervous system	8·0	0·03	1·35	0·36
Mental diseases	2·1	..	0·73	0·14
Diseases of the—				
Eye	14·3	..	0·76	0·55
Ear and nose	21·1	..	0·28	0·49
Circulatory system — Valvular disease of the heart	0·2	..	0·14	0·02
Circulatory system — Disordered action of the heart	0·9	..	0·08	0·04
Circulatory system — Other diseases	1·1	..	0·22	0·07
Blood and blood forming organs	5·5	0·03	0·28	0·38
Ductless or endocrine glands	0·1	0·03	..	0·01
Breast	0·0	..	..	0·00
Respiratory system — Larynx and trachea	0·4	0·03	..	0·02
Respiratory system — Bronchi and bronchioles	19·4	..	0·76	0·57
Respiratory system — Other diseases	1·9	..	0·17	0·13
Teeth and gums	5·0	..	0·17	0·12
Digestive system — Inflammation of tonsils	4·4	..	0·03	0·10
Digestive system — Inflammation of pharynx	12·2	..	..	0·23
Digestive system — Inflammation of stomach	2·1	0·03	0·06	0·04
Digestive system — Gastric ulcer	0·5	..	..	0·02
Digestive system — Duodenal ulcer	0·3	0·03	0·17	0·02
Digestive system — Liver	4·3	..	0·08	0·23
Digestive system — Other diseases	36·8	0·11	0·81	1·05
Diseases due to disorders of nutrition or of metabolism	0·6	..	0·08	0·04

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Diseases of the—				
Generative system	8·2	..	0·08	0·31
Bones, joints, muscles, fasciae and bursae	16·9	..	1·16	0·56
Areolar tissues	41·7	..	0·03	1·09
Skin	21·1	..	0·39	0·61
Urinary organs	2·8	..	0·25	0·13
Injuries—General	0·8	0·14	0·03	0·02
Injuries—Local	48·9	0·34	1·55	1·63
Injuries—In action	..	..	..	..
Tumours and cysts	1·7	0·03	0·14	0·06
Poisons	0·2	..	..	0·01
No appreciable disease	2·8	..	0·03	0·06
*Suicides	..	0·03	..	..
Total	554·0	1·30	12·33	18·17

*The figures against "Suicide" having already been shown under the heading of the injury, etc. which caused deaths, are not included in the total.

APPENDIX XVIII.

V. C. OFFICERS AND INDIAN OTHER RANKS.

Table showing monthly ratios for 1,000 of strength of admissions for certain diseases for all-India during the year 1940.

Months.	Group of Enteric fevers.	Influenza.	Cholera.	Small-pox.	Malaria.	Dysentery. Protozoal.	Dysentery. Bacillary.	Dysentery. Bacillary Exudate.	Dysentery. Clinical.	P. U. O.	Pneumonia (lobar and lobular).	Diarrhoea.	Dengue.	Sandfly fever.	Plague.	Effects of heat.	All Causes.
January	0·03	1·7	...	0·01	3·1	0·04	0·4	0·1	0·1	...	1·1	0·2	0·01	...	...	...	30·7
February	0·01	0·6	...	0·01	1·6	0·01	0·4	0·1	0·1	0·01	0·6	0·2	0·02	0·01	...	...	25·6
March	0·04	0·1	...	0·02	1·8	0·04	0·9	0·1	0·2	0·01	0·4	0·4	0·02	0·02	...	...	26·3
April	0·1	0·1	...	0·1	2·7	0·03	1·2	0·2	0·4	0·01	0·5	0·7	0·03	0·1	...	0·01	30·8
May	0·1	0·04	...	0·01	6·6	0·1	1·6	0·3	0·3	0·01	0·3	1·0	0·1	1·0	...	0·1	41·4
June	0·1	0·2	...	0·01	10·0	0·1	1·0	0·2	0·3	0·01	0·3	0·7	0·6	1·1	...	0·2	40·8
July	0·1	0·1	...	...	11·4	0·1	1·6	0·3	0·3	0·02	0·4	1·3	0·07	1·2	...	0·04	46·2
August	0·04	0·3	...	0·00	20·0	0·1	2·1	0·4	0·6	0·01	0·3	1·7	0·08	0·8	...	0·00	56·5
September	0·05	0·5	0·00	...	28·3	0·06	1·8	0·4	0·5	0·00	0·6	1·3	0·05	0·6	...	...	69·6
October	0·02	0·4	...	...	24·6	0·1	1·2	0·3	0·6	...	0·6	0·9	0·1	0·3	...	...	58·0
November	0·01	0·7	...	0·03	26·3	0·1	1·2	0·4	0·5	...	1·0	1·1	0·1	0·2	...	...	60·5
December	0·02	0·4	...	0·01	13·4	0·03	0·7	0·2	0·3	0·00	1·3	0·6	0·07	0·1	...	...	43·9
Total	0·5	5·1	0·00	0·2	171·2	0·8	13·6	3·1	4·5	0·1	7·9	10·6	1·1	6·0	...	0·3	551·3

APPENDIX

V. C. OFFICERS AND INDIAN

Table showing ratios per 1,000 of strength of admissions for certain

Stations and Districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para. A.	Para. B.	Para. C.	Enteric group.	Bacillary	B. exudate.	Protozoal.	Clinical.
Chitral	...	...	...	...	...	...	...	...	...
Landikotal	...	...	...	...	...	11·6	1·4	0·3	1·4
Nowshera	0·2	0·2	...	...	0·2	10·8	1·0	...	8·2
Peshawar	0·9	0·4	...	...	...	22·6	0·7	0·2	3·3
Risalpur	...	...	...	...	...	12·9	...	...	9·8
Drosh Fort	...	...	...	...	...	2·4	...	...	9·6
Malakand	...	...	...	...	...	3·4	...	...	...
Mardan	...	...	...	...		3·7	3·7	1·1	3·7
Shagai	...	...	...	...	...	6·0	...	...	3·0
Dargai	...	...	...	...	...	...	...	...	...
Total Peshawar District	0·3	0·2	...	...	0·1	13·7	0·9	0·2	4·9
Fort Lockart	...	...	...	...	...	...	8·2	2·7	...
Kohat	0·5	0·3	...	...	...	16·2	1·1	...	1·9
Thal	...	1·3	...	...	...	24·4	0·6	...	3·8
Total Kohat District	0·4	0·5	...	...	...	17·4	1·4	0·2	2·3
Abbottabad	0·4	0·2	0·2	...	...	6·8	0·4	...	4·4
Attock	...	...	...	...	...	10·8	21·5	...	2·2
Wah	...	...	...	...	...	...	...	...	...
Campbellpore	...	...	...	...	1·4	12·4	12·4	1·4	19·3
Mona	...	...	...	...	...	...	...	...	...
Jhelum	0·4	...	...	...	0·8	18·2	0·8	1·6	0·4
Sargodha	...	...	...	...	...	...	...	...	...
Kuldana	5·8	...	...	...	...	5·8	11·7	...	...
Rawalpindi	0·3	0·6	...	...	0·7	14·1	4·7	0·7	9·4
Total Rawalpindi District	0·4	0·3	0·1	...	0·5	11·8	3·5	0·6	6·4
Ambala	0·7	...	...	...	...	2·2	2·4	2·0	3·3
Amritsar	...	...	...	...	...	...	...	...	30·0
Dagshai	...	...	...	...	...	...	...	...	...
Dalhousie	...	...	...	...	...	...	...	...	...
Ferozepore	0·8	0·3	...	...	0·5	9·6	5·8	1·6	6·0
Jullundur	1·3	0·7	0·3	...	0·3	4·0	1·7	0·7	2·4
Jutogh	...	...	...	...	...	17·4	...	...	...
Bakloh	...	...	...	...	...	5·4	...	...	1·1
Lahore	0·4	1·4	...	...	...	7·8	11·0	1·2	6·8
Multan	4·2	...	...	...	...	44·0	4·2	...	6·3
Sialkot	1·1	...	...	...	0·3	...	11·4	...	...
Dharamsala	...	...	...	...	...	...	...	...	...
Solan	...	...	...	...	...	...	...	...	22·0
Subathu	...	...	...	...	...	44·0	12·6	...	6·3
Total Lahore District	0·8	0·4	0·04	...	0·2	5·8	6·9	1·0	3·9

XIX.

OTHER RANKS.

diseases in each station and district in India for the year 1940.

Diarrhœa.	Cholera.	Venereal diseases.	Small-pox.	Malaria.	Dengue.	Sandfly fever.	Plague.	Influenza.	Pneumonia (lobar and lobular.)	Heat stroke.	Heat exhaustion.	All causes.	Constantly sick.
9·9	...	...	...	9·9	...	...	...	...	...	...	...	306·9	10·40
5·5	...	5·1	...	154·6	...	32·4	...	36·8	10·9	...	6·1	440·1	12·00
8·9	...	13·9	...	115·4	...	5·8	...	0·2	7·7	0·2	1·7	476·7	13·35
2·8	...	15·0	0·2	124·8	...	36·5	...	10·0	4·9	...	...	455·4	16·55
3·7	...	9·2	...	77·2	...	8·0	...	...	3·7	...	0·6	300·2	7·25
4·8	...	...	...	49·4	...	2·4	...	...	2·4	...	...	356·6	10·02
3·4	...	5·1	...	112·1	...	...	...	...	...	...	...	232·6	6·49
3·7	...	9·8	...	169·1	...	...	...	...	6·1	...	...	392·2	9·62
12·0	...	4·5	...	35·8	...	...	...	...	3·0	...	...	220·9	4·42
...	...	...	...	222·2	...	...	...	...	...	...	...	555·6	13·33
5·3	...	10·7	0·1	117·1	...	19·6	...	9·5	6·1	0·1	1·5	418·4	12·66
5·4	...	2·7	...	198·4	...	...	...	2·7	...	...	...	339·7	8·75
6·2	...	8·4	...	294·2	...	20·2	...	2·7	7·3	...	0·3	667·8	20·16
15·0	...	5·6	...	263·8	...	13·2	...	1·3	10·0	...	...	483·7	13·05
8·6	...	7·2	...	279·4	...	16·9	...	2·3	7·6	...	0·2	594·8	17·42
8·0	...	5·4	0·2	167·9	...	0·4	...	4·2	15·8	...	...	518·7	13·22
36·6	...	25·8	...	690·3	...	2·2	...	...	8·6	...	...	1075·3	20·77
13·0	...	1·9	...	175·9	...	...	...	...	1·9	...	...	374·1	5·37
46·9	...	13·8	1·4	257·9	...	1·4	...	...	16·6	...	...	583·4	20·12
25·6	...	...	...	...	...	...	...	...	25·6	...	...	1179·5	22·31
3·2	...	5·7	...	216·5	...	...	...	4·1	17·0	...	...	551·7	15·02
...	...	...	...	418·6	...	46·5	...	...	...	...	...	907·0	13·72
17·5	...	...	...	29·2	...	...	...	...	5·8	...	...	163·7	26·08
25·0	...	17·6	0·1	163·0	...	5·5	...	2·4	10·2		0·3	578·5	23·70
17·5	...	11·5	0·2	190·5	...	2·8	...	2·9	12·8	...	0·1	562·1	18·44
15·0	...	21·9	...	143·5	...	...	...	...	9·5	...	...	519·0	17·57
..	...	30·0	...	170·0	...	...	...	...	20·0	...	10·0	690·0	23·70
..	...	...	...	...	...	...	...	...	34·5	...	...	482·8	18·97
...	...	...	...	107·1	...	...	...	3·6	21·4	0·3	1·4	178·6	25·36
6·9	...	12·4	0·3	209·3	...	21·4	...	0·7	14·5	...	...	692·3	20·17
...	...	17·5	...	113·8	...	1·0	...					482·7	15·88
17·4	...	...	...	26·1	...	...	...	1·1	13·1	1·1	...	278·3	7·57
13·1	...	1·1	...	472·8	...	...	...	0·8	11·6	...	...	862·7	20·09
15·4	...	17·0	...	147·4	...	2·4	...					523·4	16·58
...	...	16·8	...	291·4	...	...	...	...	...	...	...	515·7	15·97
26·8	...	8·5	...	153·3	...	9·4	...	...	16·8	...	...	644·2	15·75
6·1	...	2·0	...	276·2	...	...	...	...	22·4	...	...	572·9	14·95
...	...	11·0	...	131·9	...	...	...	...	11·0	...	...	681·3	25·16
6·3	...	6·3	...	226·4	...	...	...	0·9	...	...	...	465·4	11·70
12·6	...	14·5	0·04	174·7	...	5·6	...		14·1	0·1	0·3	578·3	17·20

APPENDIX

Stations and Districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para A.	Para. B.	Para. C.	Enteric group.	Bacillary	B. exudate.	Protozoal.	Clinical.
Bannu	0·2	...	...	...	0·6	33·5	0·6	0·6	0·6
Dera Ismail Khan	...	...	...	...	...	16·2	5·4	...	8·1
Kalabagh (Mari Indus)	...	...	...	...	...	23·0	...	...	23·0
Manzai	...	...	0·9	0·9	...	6·3	...	...	...
Mir Ali	...	...	...	...	...	10·7	1·3	...	4·4
Razmak	...	...	...	...	...	19·9	1·6	2·7	5·6
Wana	0·8	...	...	...	0·3	11·2	3·3	1·8	1·0
Total Waziristan District	0·2	...	0·05	0·05	0·2	20·7	1·6	1·4	4·8
Quetta	...	0·2	...	...	0·2	11·1	1·0	...	1·9
Hyderabad	...	...	...	...	...	1·0	...	...	8·0
Karachi	...	...	...	...	0·6	2·5	5·0	...	3·8
Chaman	...	0·5	...	...	...	1·1	4·8	...	3·2
Fort Sandeman	...	0·4	...	...	...	13·6	4·5	3·3	3.3
Hindubagh	...	...	...	...	...	11·2	...	...	...
Loralai	...	...	...	...	...	2·4	1·2	...	2·4
Total Western (I) District	...	0·2	...	...	0·2	7·5	2·7	0·5	2·9
Lansdowne	0·5	0·5	...	...	0·5	1·5	2·5	...	4·0
Dehra Dun	...	...	...	...	...	7·0	0·3	2·9	2·0
Nowgong	...	...	...	...	...	11·9	11·9	...	...
Meerut	0·6	....	...	...	...	10·2	3·1	0·6	0·3
Roorkee	0·3	...	...	...	0·3	7·9	6·9	1·3	3·8
Agra	...	...	...	...	0·6	11·7	4·3	...	5·6
Delhi	0·3	...	...	...	...	6·6	0·7	1·0	2·6
Muttra	0·7	...	...	...	...	15·3	0·7	1·5	1·5
Total Meerut District	0·3	0·1	...	...	0·2	8·1	2·7	1·2	2·6
Bareilly	1·2	...	...	...	...	23·0	3·4	0·3	7·0
Jhansi	0·3	...	...	...	...	48·9	0·3	0·7	2·0
Allahabad	...	...	...	...	...	12·9	1·4	6·1	4·7
Benares	...	...	...	...	...	19·9	...	6·6	13·2
Cawnpore	...	...	...	...	...	14·7	...	...	24·5
Lucknow	0·9	...	...	...	...	16·9	15·8	3·6	7·2
Almora	...	...	...	...	...	16·5	22·0	...	2·7
Kunraghat	...	...	...	...	...	3·9	...	...	...
Fatehgarh	...	...	...	...	...	9·1	10·9	0·6	18·9
Fyzabad	...	...	...	...	...	1·7	...	...	11·9
Total Lucknow District	0·5	...	...	...	...	22·8	6·6	1·9	7·4
Alipore	...	...	...	...	...	21·9	6·7	4·9	4·3
Ghoom	...	...	...	...	...	...	...	...	...
Dinapore	...	...	...	...	...	15·1	...	...	6·0
Lebong	...	...	...	...	...	200·2	...	...	...
Dacca	...	...	...	...	...	3·3	...	1·6	3·3
Gyantse	...	...	...	...	...	...	...	...	...
Midnapore	1·7	...	...	...	...	8·3	...	1·7	3·3
Shillong	...	...	...	...	...	9·8	4·5	1·6	4·1
Chittagong	...	...	...	...	0·4	...	...	...	...
Comilla	...	5·3	...	...	...	10·6	...	...	...
Total P. & A. District	0·2	0·2	...	...	0·2	11·6	3·4	2·2	3·6

XIX.—*contd.*

Diarrhœa.	Cholera.	Venereal diseases.	Small-pox.	Malaria.	Dengue.	Sandfly fever.	Plague.	Influenza.	Pneumonia (lobar and lobular).	Heat stroke.	Heat exhaustion.	All causes.	Constantly sick.
7·2	...	6·0	0·2	255·3	...	11·8	...	...	5·8	...	0·3	594·2	14·75
...	...	16·2	...	991·9	...	5·4	...	...	10·8	...	...	1294·6	28·38
9·2	...	...	...	73·7	...	...	...	...	9·2	...	9·2	414·7	10·28
32·5	...	2·7	...	128·0	...	9·9	...	0·9	4·5	...	...	447·2	11·88
6·2	...	1·8	...	683·1	...	4·0	...	...	3·1	...	0·4	940·4	14·65
4·1	...	5·6	...	368·9	...	37·8	...	...	5·6	...	...	770·5	24·11
1·0	...	5·2	...	166·4	0·3	0·5	...	1·6	3·1	...	0·3	377·4	13·55
6·3	...	5·2	0·05	325·1	0·05	16·5	...	0·3	5·0	...	0·3	648·5	17·43
8·7	...	21.4	...	120·8	...	1·0	...	...	6·7	...	...	349·2	17·63
36·0	...	20·0	...	190·0	...	1·0	...	10·0	4·0	...	...	574·4	18·03
10·8	...	13·6	...	167·9	...	0·9	...	0·3	7·0	...	...	521·8	13·70
17·5	...	7·0	...	81·8	...	...	...	...	2·7	...	...	318·6	10·20
5·4	...	18·2	...	313·9	...	1·2	...	...	7·4	...	...	637·7	19·62
29·0	...	2·2	...	107·1	...	8·9	...	...	...	...	...	290·2	5·98
4·9	...	3·7	1·2	233·5	...	1·2	...	...	3·7	...	...	435·2	11·70
11·7	...	16·1	0·1	165·3	...	1·1	...	0·7	5·8	...	...	440·0	15·72
13·4	...	7·0	...	170·1	...	...	...	0·5	8·5	...	...	577·8	20·52
5·5	0·3	10·5	0·3	213·3	...	...	...	0·3	18·3	...	...	872·3	26·05
...	...	...	...	178·6	...	...	...	...	...	...	...	809·5	14·52
8·6	...	26·5	...	246·7	...	...	...	5·2	8·0	...	...	591·6	20·60
5·0	...	10·4	...	109·4	...	...	...	...	6·3	...	...	490·6	12·55
...	...	19·1	...	64·9	...	...	...	8·6	14·2	...	...	232·9	7·34
36·5	...	21·7	0·3	148·6	...	1·0	...	0·7	7·9	...	...	540·3	19·63
9·5	...	13·8	0·7	81·5	...	...	...	1·5	9·5	...	...	382·5	12·63
11·9	0·1	15·8	0·2	161·6	...	0·2	...	2·1	10·3	...	...	571·3	18·22
21·1	...	16·2	...	107·7	0·3	0·3	...	0·9	9·8	0·3	...	480·6	17·61
11·7	...	11·1	0·7	111·5	...	...	...	29·7	6·5	...	...	646·8	21·93
14·2	...	25·0	1·4	180·4	...	...	...	...	2·7	...	...	729·4	25·16
23·2	...	16·6	...	235·1	...	3·3	...	...	6·6	...	...	758·3	22·38
34·3	...	24·5	...	225·5	...	9·8	...	4·9	14·7	...	...	701·0	25·25
3·6	...	33·6	0·3	70·8	...	...	...	0·3	8·9	0·3	...	474·8	21·28
19·2	...	2·7	...	362·6	...	...	...	57·7	8·2	...	...	758·2	24·70
7·9	...	31·5	...	476·4	...	...	...	7·9	11·8	...	3·9	1185·0	42·48
1·8	...	16·4	...	81·5	...	...	...	...	7·3	...	...	535·3	19·43
10·2	...	15·3	...	167·8	...	...	...	...	1·7	...	...	457·6	13·20
11·6	...	20·3	0·3	121·1	0·1	0·3	...	8·1	7·6	0·1	0·1	571·4	20·99
14·0	...	35·4	...	57·2	17·7	...	...	18·3	6·1	...	...	508·8	24·77
...	...	...	...	8·1	...	...	...	16·3	16·3	...	...	146·3	9·19
3·0	...	...	3·0	135·5	...	...	...	...	6·0	...	...	343·4	11·20
...	...	...	...	...	...	...	...	...	...	...	...	400·0	12·00
8·2	...	22·9	...	24·5	180·0	...	...	...	6·5	...	...	404·3	10·10
...	...	...	...	...	...	...	...	...	...	...	...	384·6	143·50
3·3	...	10·0	...	91·1	1·7	...	...	...	3·3	...	...	334·4	14·98
10·2	...	14·7	...	274·2	...	...	...	85·2	22·4	...	...	744·5	22·04
9·9	...	7·4	...	57·1	...	5·0	...	...	...	...	...	248·1	7·42
...	...	15·9	...	89·9	...	...	...	10·6	...	...	...	523·8	12·17
9·3	...	20·3	0·2	143·0	21·7	0·3	...	87·6	11·6	...	...	539·1	20·65

APPENDIX

Stations and Districts.	Enteric group of fevers.					Dysentery.			
	Typhoid fever.	Para. A.	Para. B.	Para. C.	Enteric group.	Bacillary.	B. oxidate.	Protozoal.	Clinical.
Jubbulpore	0·4	0·2	....	...	0·4	22·0	1·3	0·4	5·7
Kamptee	...	...	...	...	...	3·7	1·5	...	...
Pachmari	...	...	...	...	...	2·0	...	...	...
Saugor	...	....	...	...	....	3·0	3·0	...	6·0
Total Jubbulpore Bde. Area	0·3	0·1	...	...	0·3	16·4	1·3	0·3	4·3
Ahmednagar	0·5	...	...	...	...	13·0	2·1	...	...
Belgaum	0·4	...	...	...	...	3·0	...	...	...
Poona	0·2	...	...	...	...	24·1	1·0	0·3	2·0
Secunderabad	...	...	...	...	0·4	34·7	2·0	...	11·0
Aurangabad	...	...	...	...	...	11·4	...	....	4·6
Total Deccan District	0·2	...	....	...	0·1	22·4	1·2	0·1	4·1
Ahmedabad	...	...	...	...	...	4·7	4·7	...	11·0
Bombay	...	...	...	...	0·5	24·7	6·3	1·1	5·3
Deolali	0·6	...	...	...	...	...	2·8	1·1	5·1
Mhow	...	...	...	....	...	19·6	...	...	...
Mount Abu	...	...	...	...	...	...	...	...	...
Nasirabad	1·1	...	...	...	...	10·1	...	...	6·7
Baroda	...	...	...	...	...	5·8	...	0·7	...
Total Bombay District	0·3	...	...	...	0·2	12·1	3·0	1·4	4·8
Bangalore	0·6	...	...	...	0·6	12·7	4·2	0·6	6·9
Madras	...	...	...	...	1·7	23·7	3·4	...	10·2
Cannanore	...	...	...	...	...	7·7	7·7	...	...
Trichnopoly	...	....	...	...	...	13·2	...	...	29·8
Total Madras District	0·4	...	...	...	0·6	13·2	4·3	0·4	7·6
TOTAL—ALL INDIA	0·4	0·2	0·02	0·01	0·2	13·8	3·1	0·9	4·6

XIX.—*concld.*

Diarrhœa.	Cholera.	Venereal diseases.	Small-pox.	Malaria.	Dengue.	Satisfy fever.	Plague.	Influenza.	Pneumonia (lobar and lobular).	Heat stroke.	Heat exhaustion.	All causes.	Constantly sick.
4·0	...	29·6	...	177·4	...	6·9	...	0·2	3·6	...	...	618·7	25·46
4·4	...	8·1	0·7	33·7	6·6	9·5	...	2·2	...	...	2·2	262·1	7·39
2·9	...	...	...	80·7	...	...	...	...	...	...	...	135·4	2·56
11·9	...	3·0	...	249·3	...	3·0	...	17·8	8·9	...	...	439·2	12·20
4·4	...	22·4	0·1	147·3	1·3	6·9	...	1·5	2·9	...	0·4	513·8	20·01
8·9	...	47·4	...	64·6	...	...	...	...	3·6	...	...	367·2	11·70
11·4	...	34·1	0·4	67·3	0·9	...	...	...	6·1	...	...	763·5	19·95
20·9	...	61·0	...	227·3	...	...	...	...	8·5	...	...	706·5	17·97
9·4	...	21·0	0·4	50·5	...	0·2	...	6·5	4·0	...	...	400·0	15·25
6·8	...	89·0	2·3	221·5	2·3	...	...	18·3	16·0	...	...	691·8	14·22
14·2	...	44·3	0·3	133·4	0·2	0·1	...	2·4	6·4	...	...	582·0	16·57
9·4	...	26·7	1·6	191·5	...	1·6	...	9·4	7·8	...	...	460·0	12·32
7·4	...	40·5	...	108·8	0·5	1·1	...	...	8·9	...	...	541·5	18·59
23·8	...	55·1	0·6	87·4	...	...	...	11·4	7·4	...	...	594·8	19·22
14·2	...	7·6	...	203·9	...	1·1	...	...	4·4	...	...	725·2	23·38
222·2	...	...	...	...	...	...	...	...	...	...	...	443·4	4·44
16·8	...	7·8	...	306·5	...	4·5	...	5·6	4·5	...	...	888·3	23·92
9·7	...	21·4	...	287·9	...	3·9	...	1·9	3·9	...	...	605·1	16·98
14·6	...	32·5	0·3	172·7	0·2	1·5	...	4·8	6·8	...	...	624·8	19·39
9·4	...	60·9	0·2	33·0	1·9	...	...	...	2·9	...	...	407·6	17·86
3·4	...	50·8	...	10·9	54·1	...	...	192·9	6·8	...	1·7	583·8	21·49
15·5	...	54·2	1·5	38·7	...	...	...	48·4	2·1	...	...	718·3	22·59
16·6	...	79·5	...	43·0	...	...	...	6·6	...	...	...	606·0	19·64
9·8	...	40·2	0·3	32·6	6·2	...	...	21·9	3·1	...	0·1	461·7	18·71
10·9	0·01	18·9	0·1	173·2	1·1	5·9	...	5·1	8·3	0·08	0·3	549·0	17·51

APPENDIX XX.

V. C. OFFICERS AND INDIAN OTHER RANKS.

Table showing admission and death ratios per 1,000 of strength by Commands contrasted with the previous year and the average for the previous five years.

Commands.		Enteric Group of fevers.		Influenza.		Cholera.		Small-pox.		Malaria.		Dysentery.	
		A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
Northern	1935-39	0·9	0·06	4·9	0·01	0·2	0·01	0·1	0·01	126·8	0·04	13·2	0·04
	1939	0·5	0·03	3·4	0·02	...	...	0·2	0·03	124·5	0·05	15·8	0·07
	1940	1·0	0·08	3·1	...	...	...	0·1	0·01	211·1	0·05	21·7	0·04
Western (I.) District	1935-39	0·9	0·07	2·8	0·02	...	...	0·1	...	136·3	0·09	12·0	0·03
	1939	1·0	0·09	0·8	...	...	...	...	...	121·5	...	15·1	...
	1940	0·4	...	0·7	...	...	...	0·1	...	164·3	0·06	13·7	...
Eastern	1935-39	0·9	0·10	4·2	...	0·02	0·01	0·3	0·02	101·1	0·08	14·4	0·02
	1939	0·6	0·12	4·0	...	0·04	...	0·3	0·04	103·1	0·04	19·2	0·04
	1940	0·5	0·03	10·2	...	0·03	0·03	0·2	0·05	143·3	0·13	24·7	...
Southern	1935-39	0·7	0·08	8·9	...	...	...	0·1	0·02	85·0	0·01	16·4	0·02
	1939	0·2	0·05	5·6	...	...	...	...	...	117·4	0·05	19·1	0·05
	1940	0·6	0·03	6·4	...	...	...	0·3	...	125·9	0·17	25·1	...
All-India	1935-39	0·9	0·07	5·5	0·01	0·1	0·01	0·2	0·01	115·6	0·05	15·8	0·03
	1939	0·5	0·06	3·7	0·01	0·01	...	0·2	0·03	118·3	0·04	17·1	0·04
	1940	0·7	0·05	5·1	...	0·01	0·01	0·1	0·02	173·2	0·09	22·3	0·02

Commands.		Pyrexia of uncertain origin.		Pneumonia, lobar and lobular.		Venereal diseases.		Dengue.		Sandfly fever.		Plague.	
		A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
Northern	1935-39	0·1	0·01	5·8	0·54	6·2	0·01	0·0	...	11·5	...	...	...
	1939	0·1	0·02	5·7	0·25	5·3	0·02	0·0	...	7·8	...	...	...
	1940	0·1	0·05	9·5	0·19	10·3	...	0·0	...	11·4	...	...	...
Western (I.) District	1935-39	0·0	...	4·4	0·41	5·2	...	0·0	...	7·2	...	...	...
	1939	0·1	...	5·4	0·44	5·5	...	...	...	13·7	...	...	...
	1940	...	...	5·8	0·37	16·1	0·06	...	...	1·1	...	...	...
Eastern	1935-39	0·0	...	5·9	0·42	11·8	...	4·0	...	2·4	...	...	...
	1939	0·1	...	6·1	0·39	10·5	...	1·8	...	3·0	...	...	...
	1940	0·1	...	9·4	0·51	18·2	...	3·6	...	0·2	...	...	...
Southern	1935-39	0·1	...	3·1	0·24	11·8	0·01	7·0	...	0·9	...	...	...
	1939	0·1	...	3·5	0·19	17·0	...	4·0	...	0·3	...	...	...
	1940	0·1	0·03	5·2	0·22	40·9	...	1·5	...	1·6	...	...	...
All-India	1935-39	0·1	0·01	5·2	0·44	8·9	0·01	2·6	...	1·3	...	...	...
	1939	0·1	0·01	5·4	0·29	8·5	0·01	1·1	...	6·0	...	...	...
	1940	0·1	0·03	8·3	0·29	18·9	0·01	1·1	...	5·9	...	...	...

A = Admission.
D = Death.

APPENDIX XXI.

BRITISH OFFICERS OF THE INDIAN ARMY.

Table showing ratios per 1,000 of the strength of admissions into hospital, deaths, numbers invalided and constantly sick during the year 1940.

Diseases.	Admissions.	Deaths.	Invalids.	Constantly sick.
Specific diseases due to infection or infestation.				
Common cold	9·8	..	..	0·12
Diphtheria	0·5	..	..	0·04
Dysentery	27·9	0·26	..	1·03
Enteric fevers (inclusive of typhoid, Para. A, B and C and enteric group)	1·6	0·26	..	0·20
Erysipelas	0·3	..	..	..
Influenza	13·5	..	..	0·28
Malaria	47·9	..	..	11·7
Measles	1·6	..	..	0·05
Meningococcal infection	0·5	0·26	0·26	0·03
Mumps	0·3	..	..	0·01
Pneumonia	5·9	0·52	..	0·32
Pyrexia of uncertain origin	0·3	..	..	0·2
Rheumatic fever	0·8	..	..	0·08
Sandfly fever	16·0	..	..	0·28
Scarlet fever	..	..	..	..
Small-pox	..	..	..	..
Tuberculosis — Pulmonary	1·8	..	0·78	0·28
Tuberculosis — Other	..	..	..	..
Venereal Diseases — Gonorrhœa	0·3	..	..	0·01
Venereal Diseases — Soft chancre	..	..	..	..
Venereal Diseases — Syphilis	0·5	..	..	0·04
Venereal Diseases — Other V. D.	..	..	..	..
Other diseases due to infection	10·1	0·26	..	0·39
Diseases due to infestation by metazoan parasites — Scabies	..	..	..	..
Diseases due to infestation by metazoan parasites — Other diseases	4·1	..	..	0·10
Other diseases classified under systems.				
Diseases of the nervous system	8·0	0·52	0·26	0·46
Mental diseases	3·6	..	..	0·29
Diseases of the—				
Eye	3·9	..	..	0·11
Ear and nose	18·9	..	..	0·33
Circulatory system — Valvular disease of the heart.	0·3	0·26	..	..
Circulatory system — Disordered action of the heart.	2·3	..	..	0·05
Circulatory system — Other diseases	6·2	0·26	0·26	0·19
Blood and blood forming organs	2·3	..	..	0·07
Ductless or endocrine glands	0·3	..	..	0·01
Breast	..	..	..	..
Respiratory system — Larynx and trachea	1·6	..	..	0·02
Respiratory system — Bronchi and bronchioles.	7·2	..	..	0·13
Respiratory system — Other diseases	3·4	..	..	0·11
Teeth and gums	4·9	..	..	0·09

Other diseases classified under systems—contd.				
Digestive system — Inflammation of tonsils	22·8	..	..	0·40
Inflammation of pharynx.	13·5	..	..	0·19
Inflammation of stomach.	8·8	..	..	0·17
Gastric ulcer	0·3	..	..	0·02
Duodenal ulcer	1·0	..	..	0·08
Liver	17·1	..	..	0·61
Other diseases	71·9	..	0·26	1·79
Diseases due to disorders of nutrition or of metabolism.	2·3	..	..	0·16
Diseases of the—				
Generative system	3·6	..	..	0·16
Bones, joints, muscles, fasciæ and bursæ	12·2	0·26	..	0·41
Areolar tissues	30·0	0·26	..	0·64
Skin	7·5	..	..	0·23
Urinary organs	9·3	..	0·26	0·25
Injuries — General	3·1	0·26	..	0·09
Local	47·6	0·26	..	1·41
In action	1·3	1·03	..	0·20
Tumours and cysts	2·3	..	0·26	·05
Poisons	2·3	0·52	..	·07
No appreciable disease	3·1	..	..	·10
* Suicides	..	..	..	..
TOTAL	466·4	5·17	2·33	13·25

* The figures against "Suicide" having already been shown under the heading of injury, etc. which caused deaths, are not included in the total.

APPENDIX XXII.

DETAIL OF DISEASES.

RATIOS PER 1,000 OF STRENGTH.

Diseases.	British troops.										Indian Troops.					
	British officers (B. S.).			B. O. Rs.				B. O. Rs. (Wives).		R. O. Rs. Children.	British officers. (I. S.).			V. C. Os. and I. O. Rs.			
	A.	D.	Invalid.	A.	Average constantly sick.	D.	Invalids.	A.	D.	A.	D.	A.	D.	Invalids.	A.	D.	Invalids.	Average constantly sick.
Diseases caused by infection or infestation.																		
Blackwater fever	...	...	...	...	...	...	...	...	...	...	...	0·3	...	...	0·0	...	...	0·00
Chicken-pox	...	...	...	0·5	0·03	...	...	...	...	1·2	...	0·8	...	...	1·0	...	...	0·05
Common cold	8·9	...	...	9·3	0·16	...	...	4·3	...	9·5	...	9·8	...	...	24·7	...	...	0·39
Cholera	...	...	...	0·0	0·00	0·03	...	...	...	...	...	...	...	...	0·0	0·00	...	0·00
Dengue	4·5	...	...	6·8	0·17	...	...	1·7	...	0·2	...	5·2	...	...	1·1	...	...	0·02
Diphtheria	5·0	...	...	2·5	0·24	0·06	...	1·3	...	6·6	0·49	0·5	...	...	0·0	...	...	0·00
Dysentery—																		
Protozoal	6·9	...	...	2·8	0·21	...	0·03	0·7	...	1 0	...	4·7	...	...	0·9	...	...	0·04
Bacillary	26·8	0·50	...	20·5	0·79	0·06	0·03	6·7	...	24·5	1·21	13·2	0 26	...	13·2	0·00	0·00	0 44
Bacillary Exudate	5·9	...	...	3·4	0·13	...	...	3·3	...	6·6	0·24	3·1	...	...	3·1	0·00	...	0·10
Clinical	7·9	...	...	6·3	0·23	...	...	2·0	...	7·0	0·97	7·0	...	...	4·6	0·00	...	0·13
Enteric fevers—																		
Typhoid fever	0·5	...	...	0·4	0·06	...	...	...	...	0·7	...	1·3	0·26	...	0·4	0·04	...	0·05
Paratyphoid "A"	0·5	...	...	0·6	0·06	...	...	...	...	...	...	...	...	...	0·4	...	...	0·02
Paratyphoid "B"	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·00	...	0·00
Paratyphoid "C"	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·00
Enteric group	0·5	...	...	0·2	0·04	...	...	0·3	...	...	...	0·3	...	...	0·2	0·00	...	0·02
Enteritis infective, (including food poisoning).	...	...	...	0·1	0·00	...	...	0·3	...	0·7	0·24	...	...	...	0·0	...	...	0·00
Erysipelas	1·0	...	...	0·3	0·01	...	...	0·3	...	...	...	0·3	...	...	0·0	...	...	0·00
Hydrophobia (Rabies)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·01	...	0·00
Influenza	9·9	...	...	12·1	0·31	...	...	4·7	...	4·1	...	13·5	...	...	5·1	...	...	0·09
Jaundice epidemic catarrhal	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Leishmaniasis—																		
Kala-azar	...	...	...	0 1	0·01	...	...	...	...	...	...	...	...	...	0·3	0·02	0·04	0·06
Oriental sore	...	...	...	0·7	0·04	...	...	...	...	0·5	...	0·3	...	...	0·5	...	...	0·07

Leprosy	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·1	...	0·10	0·01
Malaria	44·6	...	...	73·4	2·82	...	...	33·4	...	25·5	...	47·9	...	...	173·2	0·09	0·08	3·71
Measles	1·5	...	...	1·7	0·07	...	...	0·3	...	9·5	0·24	1·6	...	...	1·0	...	...	0·03
Meningococcal infection (cerebro-spinal fever).	...	...	...	0·2	0·03	...	...	...	...	...	...	0·5	0·26	0·26	0·5	0·09	...	0·03
Mumps	1·0	...	...	0·7	0·02	...	...	...	...	0·5	...	0·3	...	...	9·3	...	...	0·37
Plague	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Poliomyelitis acute	1·5	...	...	...	0·00	...	...	...	...	0·5	...	0·5	...	...	...	...	0·01	...
Pyaemia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	0·01	...	0·00
Pyrexia of uncertain origin	0·5	...	...	0·4	0·04	...	...	...	...	...	...	0·3	...	...	0·1	0·03	...	0·01
Relapsing fever	...	...	...	...	...	...	...	...	...	...	...	0·3	...	...	0·0	...	...	0·00
Phenmatic fever	1·0	...	...	1·7	0·26	...	0·18	0·7	...	0·7	...	0·8	...	...	0·9	...	0·03	0·05
Rubella (German measles)	1·0	...	...	2·1	0·06	...	...	...	...	...	...	...	...	...	0·0	...	...	0·00
Sandfly fever	21·8	...	...	25·7	0 54	...	...	2·7	...	2·7	...	16·0	...	...	5·9	...	...	0·10
Scarlet fever	1·5	...	...	0·5	0·05	...	...	...	...	1·9	0·24	...	...	...	...	...	...	...
Septicaenia	0 5	...	...	0·1	0·01	0·03	...	...	...	0·2	0·24	0·3	...	...	0·0	0·01	...	0·00
Small-pox	...	...	...	0·4	0·04	0·03	...	0·7	0·33	0·2	...	...	...	...	0·1	0·01	...	0·01
Tuberculosis pulmonary	2·0	...	2·97	2·2	0·55	0·06	1·77	0·7	...	...	...	1·8	...	0·78	2·2	0·10	2·02	0·27
Tuberculosis other cases	...	...	...	0·1	0·03	...	0·06	...	...	1·5	0·24	...	...	...	0·4	0·00	0·27	0·04
Typhus fever	3·0	...	...	0·9	0·11	0·03	...	0·3	...	...	...	1·0	0·26	...	0·1	0·00	...	0·01
Undulent fever	...	...	...	...	...	...	....	...	...	...	...	0·3	...	...	0·0	...	...	0·01
Venereal diseases—																		
Gonorrhoea	...	...	...	30·9	1·79	...	0·03	0·3	...	...	...	0·3	...	...	7·5	...	0·03	0·50
Soft chancre	...	...	...	8·9	0·64	...	...	...	...	...	...	...	...	...	1·4	...	...	0·09
Syphilis	...	...	...	12·7	0·94	...	...	...	...	...	...	0·5	...	...	6·1	0·00	0·08	0·52
Other cases	...	...	...	5·6	0·30	...	...	...	...	...	...	...	...	...	8·9	...	0·00	0·21
Whooping-cough	...	...	...	...	...	...	...	...	...	1·0	0·24	...	...	...	...	...	...	...
Other diseases caused by infection.	3·0	...	...	2·3	0·08	0 30	0·06	0·3	...	0·5	...	1·3	...	...	0·2	...	0·00	0 01
Diseases due to infestation by metazoan parasites.																		
Ankylostomiasis	...	...	...	0·1	0·02	...	...	0·3	...	...	...	0·5	...	...	6·0	...	0·01	0·20
Ascariasis	...	...	...	0·2	0·00	...	...	0·3	...	1·2	...	...	...	...	0·7	...	...	0·03
Bilharziasis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dracontiasis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2·8	0·00	0·03	0·15
Filariasis	...	...	...	...	...	...	...	0·3	...	0·2	...	1·0	...	...	0·0	...	0·00	0·00
Taenia Solium	1·0	...	...	0·2	0·00	...	...	1·0	...	0·5	...	0·8	...	...	0·0	...	...	0·00
Taenia Saginate	...	...	...	2·3	0·05	...	...	2·7	...	2·9	...	0·3	...	...	0·3	...	...	0·01
Other intestinal parasites	...	...	...	0·2	0·01	...	...	0·7	...	...	...	1·3	...	...	0·1	...	...	0·00
Pediculosis	...	...	...	0·1	0·00	...	...	...	...	...	...	...	...	...	0·0	...	...	0·00
Scabies	...	...	...	1·7	0·06	...	...	...	...	0·5	...	...	...	...	16·8	...	...	0·50
Other diseases due to infestation.	...	...	...	0·3	0·01	...	...	0·3	...	...	...	0·3	...	...	0·2	...	...	0·01
Diseases of the nervous system																		
Aphasia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cerebral haemorrhage	...	0·50	...	0·0	0·00	...	...	...	0·33	...	...	0·3	0·26	...	0·0	0·01	...	0·00
Chorea	...	...	...	0·0	0·00	...	...	...	...	0·5	...	...	...	...	...	...	...	...
Convulsions	0·5	...	1·00	0·5	0·04	...	0·09	...	...	2·2	0·73	...	...	...	0·0	...	0·00	0·00
N. Y. D. Convulsions	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

APPENDIX XXII—*contd.*

Diseases.	British Troops.										Indian Troops.						
	British officers (B. S.).			B. O. Rs.				B. O. Rs. (Wives).		B. O. Rs. Children.		British officers. (I. S.).			V. C. Os. and I. O. Rs.			
	A.	D.	Invalids.	A.	Average constantly sick.	D.	Invalids.	A.	D.	A.	D.	A.	D.	Invalids.	A.	D.	Invalids.	Average constantly sick.
Other diseases of the spinal cord.	...	...	...	0·1	0·04	0 03	0·09	...	...	...	...	0·5	...	...	0·0	0·00	0·01	0·00
Epilepsy	...	...	...	0·2	0 02	...	0 06	1·3	...	0·5	...	0·3	...	...	1·0	0·00	0·55	0 06
Vertigo	1·0	...	...	1·0	0·02	...	...	1·0	...	...	...	1·0	...	...	0·5	...	...	0·01
Meningitis	...	...	...	0·1	0·00	...	...	...	...	0·2	0·24	0·3	0·26	...	0·0	...	...	0·00
Headache	5·0	...	...	5·5	0·12	...	0·03	1·7	...	0·2	...	...	...	...	0·2	...	0·00	0·01
Neuralgia	0·5	...	...	0·5	0·01	...	...	0·3	...	...	...	1·0	...	...	0 3	...	...	0 01
Neuritis	0·5	...	...	0·3	0·04	...	0·03	0·7	...	0·2	...	0·5	...	...	0·3	...	0 06	0 03
Paralysis	...	...	...	0·1	0.03	...	...	0·3	0·33	...	...	1·0	...	...	0·4	...	0·09	0 03
Migraine	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sciatica	2·0	...	...	1·0	0.05	...	...	...	...	...	...	0·8	...	...	1·6	...	0·09	0·08
Other diseases of the nervous system.	4·5	...	1·98	1·5	0·10	0·12	0·15	0·3	...	0·7	0·49	2·3	...	0·26	0·7	...	0·11	0 04
Mental diseases.																		
Feeblemindedness	...	...	...	0·0	0·03	...	0·09	...	...	...	...	...	...	...	0·0	...	0·00	0·00
Hysteria	...	...	...	0·8	0·10	...	0·12	1·0	...	...	...	0·3	...	...	1·0	...	0·28	0·07
Involution (melancholia)	...	...	...	0·1	0·03	...	0·09	...	...	...	...	...	...	...	0·0	...	...	0·00
Mania	...	...	...	0·1	0·02	...	0·12	...	...	...	...	...	...	...	0·1	...	0·08	0·01
Mental deficiency	...	...	...	0·0	0·01	...	0·03	...	...	...	...	...	...	...	0·0	...	...	0·00
Neurasthenia	1·5	...	0·50	0·5	0·05	...	0·03	1·0	...	...	...	0·8	...	...	0 2	...	0·05	0·01
Schizophrenia (dementia praecox).	...	...	...	0·3	0 09	...	0·34	1·0	...	...	...	...	...	...	0·2	...	0·18	0·04
Other mental diseases	2·5	...	...	1·2	0·22	...	0·56	2·3	...	...	...	2·6	...	...	0·4	0·00	0·18	0·04
Diseases of the eye.																		
Amblyopia and amaurosis	...	...	...	0·1	0·00	...	...	...	...	...	...	0·3	...	...	0·0	...	0·02	0·00
Anomalies of refraction	...	...	...	0·2	0·00	...	0·03	...	...	...	...	0·5	...	...	0·1	...	0·20	0·00
Blepharitis	...	...	...	0·1	0·00	...	...	...	...	0·2	...	...	...	...	0·0	...	...	0·00
Conjunctivitis	1·0	...	...	1·6	0·05	...	0·03	2·0	...	6·1	...	0·8	...	...	7·9	...	...	0·24
Cataract	0·5	...	...	0·0	0·00	...	...	...	...	...	...	0·5	...	...	0·1	...	0·06	0·01
Conjunctivitis granular (Trachoma).	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·5	...	0·19	0·08
Glaucoma	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·00	0·00
Iritis	0·5	...	...	0·1	0·01	...	...	...	...	...	...	...	...	...	0·2	...	0·00	0·01
Keratitis	1·5	...	0·50	0·8	0·05	...	0·03	...	...	...	...	0·3	...	...	1·7	...	0·05	0·07
Retinitis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0 0	...	0·03	0·00
Other diseases of the eye	2·0	...	...	1·1	0·06	...	0·03	1·3	...	...	...	1·6	...	...	2·0	...	0·38	0·09

Diseases of the ear.																			
Inflammation of the external ear.	2·0	...	...	6·0	0·17	...	...	0·3	...	1·7	...	1·8	...	...	1·0	...	...	0·02	
Diseases of the middle ear	1·5	...	...	5·8	0·24	...	0·09	0·7	...	4·4	...	2·3	...	...	3·2	...	0·31	0·12	
Furunculosis	2·0	...	...	1·8	0·05	...	...	1·0	...	0·7	...	1·8	...	...	0·6	...	...	0·01	
Diseases of the mastoid process.	0·5	...	...	0·4	0·04	...	...	...	...	0·5	...	...	...	...	0·1	0·00	...	0·01	
Other diseases of the ear	...	...	...	0·3	0·01	...	...	...	...	0·2	...	...	...	...	0·2	...	0·03	0·01	
Diseases of the nose.																			
Diseases of the mucous membrane.	10·0	...	...	12·3	0·22	...	...	6·0	...	6·6	...	5·4	...	...	5·5	...	...	0·09	
Diseases of the bone and cartilage.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Sinusitis	5·0	...	...	2·9	0·10	...	...	2·3	...	0·2	...	3·1	...	...	0·4	...	0·00	0·02	
Other diseases of the nose.	4·0	...	...	3·6	0·12	...	...	0·7	...	...	...	4·4	...	...	0·1	...	...	0·00	
Diseases of the circulatory system.																			
Diseases of the valves	...	...	...	0·5	0·08	...	0·18	...	...	0·5	0·24	0·3	0·26	...	0·2	...	0·16	0·01	
Disordered action of the heart.	3·0	...	...	2·3	0·13	0·03	0·09	4·0	...	0·2	0·24	2·3	...	...	0·7	0·03	0·14	0·04	
Diseases of the blood vessels.	0·5	...	...	2·1	0·09	0·03	...	3·3	...	...	...	4·7	...	0·26	0·6	0·03	0·09	0·03	
Endocarditis	0·5	...	0·50	0·1	0·02	...	0·06	...	...	0·2	...	...	...	...	0·0	...	0·02	0·00	
Myocarditis	1·5	...	0·50	0·2	0·03	...	0·03	...	...	...	...	0·8	0·26	...	0·1	...	0·01	0·01	
Pericarditis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	0·03	0·01	
Other diseases of the circulatory system.	0·5	...	...	0·4	0·05	0·06	0·06	...	...	...	...	0·8	...	...	0·1	0·02	0·08	0·01	
Diseases of the blood and blood forming organs.																			
Anaemia primary	0·5	...	...	0·7	0·01	...	...	1·8	...	...	...	...	...	...	0·2	0·00	0·01	0·01	
Anaemia pernicious	...	...	...	...	...	...	...	0·7	...	...	...	...	...	...	0·1	...	0·04	0·01	
Anaemia secondary	...	...	...	0·3	0·04	...	...	1·3	...	0·2	...	0·8	...	...	2·2	...	0·05	0·15	
Diseases of the spleen	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·5	...	0·01	0·01	
Lymphadenitis	2·5	...	...	6·1	0·43	...	...	...	...	3·6	...	1·3	...	...	1·7	...	0·05	0·08	
Lymphangitis	...	...	...	0·5	0·01	...	...	...	...	0·2	...	0·3	...	...	0·0	...	...	0·00	
Other blood diseases	0·5	...	...	1·0	0·09	0·12	...	...	...	...	...	...	...	...	0·2	0·02	0·03	0·01	
Diseases of glands of internal secretion.																			
Goitre	...	...	...	0·1	0·03	...	...	0·3	...	...	...	...	...	...	0·1	...	0·01	0·00	
Hyperthyroidism	...	...	...	0·1	0·02	...	...	0·3	...	...	...	...	...	...	0·0	...	0·02	0·00	
Other diseases	...	...	...	0·0	0·00	...	...	0·7	...	0·2	...	0·3	...	...	0·0	0·00	0·00	0·00	
Diseases of the breast.																			
Mastitis	...	...	...	0·1	0·00	...	...	0·3	...	...	...	...	...	...	0·0	...	...	0·00	
Other diseases	...	...	...	...	...	...	...	0·3	...	...	...	...	...	...	...	...	...	...	

APPENDIX XXII—*contd.*

Diseases.	British Troops.										Indian Troops.					
	British officers (B. S.).			B. O. Rs.			B. O. Rs. (Wives).		B. O. Rs. Children.		British officers (I. S.).			V. C. Os. and I. O. Rs.			
	A.	D.	Invalids.	A	Average constantly sick.	D.	Invalids.	A	D.	A.	D.	A.	D.	Invalids.	A.	D.	Invalids.	Average constantly sick.
Diseases of the respiratory system.																		
Asthma	2·0	...	...	1·1	0·06	...	0·12	1·7	...	1·5	...	0·8	...	...	1·3	...	0·33	0·07
Bronchitis	10·4	...	...	19·8	0·78	...	0·03	6·7	...	31·3	...	6·5	...	...	15·2	0·00	0·28	0·44
Empyema	...	...	...	0·2	0·03	...	...	...	...	...	...	...	...	...	0·0	0·01	...	0·00
Laryngitis	1·0	...	...	0·7	0·02	...	...	...	...	1·0	...	0·5	...	...	0·7	0·00	...	0·02
Pleurisy	2·5	...	...	2·1	0·22	...	...	2·7	...	0·5	...	2·3	...	...	2·0	...	0·14	0·18
Pneumonia—																		
(*a*) Lobar	2·5	0·50	...	4·4	0·33	0·33	...	3·0	...	3·2	0·97	2·6	0·26	...	7·1	0·23	0·00	0·41
(*b*) Lobular (broncho-pneumonia).	0·5	0·50	...	1·6	0·14	0·03	...	1·0	...	5·6	0·73	3·4	0·26	...	1·1	0·05	...	0·07
Tracheitis	0·5	...	...	1·1	0·02	...	...	...	...	...	...	1·0	...	...	0·1	...	...	0·00
Other diseases	0·5	...	...	0·5	0·07	...	0·06	...	...	0·2	...	1·0	...	...	0·1	...	0·03	0·01
Diseases of the teeth and gums.																		
Caries of the enamel, dentine and cementum.	1·5	...	...	1·4	0·02	...	...	1·3	...	2·9	...	0·8	...	...	0·7	...	...	0·01
Gingivitis	...	...	...	0·7	0·02	...	...	...	...	0·2	...	0·5	...	...	1·1	...	0·00	0·02
Pyorrhoea alveolaris	...	...	...	1·2	0·02	...	...	...	...	0·5	...	2·1	...	...	1·0	0·00	0·30	0·03
Other diseases	...	...	...	0·5	0·01	...	...	0·7	...	1·0	...	1·6	...	...	0·3	...	0·01	0·01
Diseases of the digestive system.																		
Appendicitis	11·9	...	...	8·6	0·54	0·03	...	7·7	...	4·6	0·24	9·1	...	...	1·6	0·03	0·06	0·09
Cholecystitis and cholangitis	3·0	...	...	0·3	0·01	...	...	2·0	...	...	...	0·5	...	...	0·2	...	0·01	0·01
Colic	3·5	...	...	5·6	0·13	...	...	3·3	...	1·0	...	2·3	...	...	1·6	...	...	0·03
Colitis	2·0	...	...	0·7	0·02	...	0·03	...	...	0·2	...	1·0	...	...	0·7	...	. .	0·02
Constipation	3·5	...	...	6·3	0·12	...	...	3·7	...	7·0	...	3·4	...	...	3·2	...	. .	0·04
Diarrhoea	43·1	...	...	25·0	0·54	...	...	12·3	...	29·2	0·73	24·6	...	...	10·9	...	...	0·22
Enteritis	2·5	...	...	1·1	0·02	...	...	0·3	...	5·6	1·46	9·3	...	...	0·2	0·01	...	0·01
Fistula in ano	...	...	...	0·2	0·02	...	...	0·3	...	...	...	0·8	...	...	0·6	...	0·01	0·03
Gastritis	5·9	...	...	8·5	0·26	...	...	5·0	...	3·4	...	8·8	...	...	1·2	...	0·02	0·04
Glossitis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·1	0·00	...	0·00
Hoemorrhoids (piles)	3·0	...	...	5·2	0·21	...	...	0·3	...	...	...	3·4	...	...	2·8	...	0·12	0·12
Hepatitis acute (amoebic).	3·0	...	...	0·4	0·03	...	...	1·0	...	...	...	0·8	...	...	0·1	...	0·00	0·01

Hepatic abscess (Tropical abscess).	...	...	...	0·1	0·01	...	...	...	...	...	...	...	...	...	0·0	0·00	...	0·00
Hepatitis (non-amœbic) (cirrhosis).	...	...	...	0·5	0·02	...	...	...	...	...	...	2·8	...	...	0·5	0·00	0·01	0·03
Hernia	1·5	...	...	3·5	0·24	...	...	...	...	1·7	...	4·4	...	...	1·5	...	0·18	0·08
Hypertrophy of the tonsils	2·5	...	...	2·5	0·08	...	...	2·3	...	17·2	...	1·3	...	...	0·1	...	...	0·00
Indigestion	2·0	...	...	3·3	0·09	...	...	1·7	...	2·2	...	3·9	...	...	6·9	...	0·00	0·16
Intestinal obstruction	0·5	...	0·50	0·1	0·01	...	...	...	...	...	...	0·3	...	...	0·0	0·01	...	0·00
Duodenal Ulcer	...	...	...	1·1	0·10	...	0·09	...	...	...	...	1·0	...	...	0·1	0·01	0·07	0·01
Inflammation of the palate and pillars of the fauces.	...	...	...	0·0	0·00	...	...	...	...	...	...	...	...	...	0·0	...	...	0.00
Jaundice	23·3	...	...	9·1	0·46	...	...	3·7	...	5·3	...	13·5	...	...	4·3	0·00	...	0·22
Pharyngitis	17·9	...	...	15·3	0·36	...	...	2·0	...	1·9	...	13·5	...	...	17·5	...	...	0·31
Peritonitis	...	...	...	0·1	0·01	0·03	...	0·7	...	...	...	...	...	...	0·0	...	0·00	0·00
Quinsy	1·0	...	...	2·1	0·07	...	...	1·3	...	0·5	...	1·0	...	...	0·2	...	...	0·00
Sprue	1·0	...	...	0·1	0·02	...	0·03	1·0	...	...	...	1·0	...	0·26	0·0	...	0·00	0·00
Gastric Ulcer	0·5	...	...	1·0	0·09	...	0·09	0·3	...	0·2	...	0·3	...	...	0·1	0·00	0·01	0·00
Stomatitis	...	...	...	0·3	0·02	...	...	...	...	0·7	...	0·3	...	...	0·2	...	...	0·01
Tonsilitis	26·8	...	...	13·2	1·14	...	...	13·7	...	38·6	...	22·8	...	...	5·0	...	0·01	0·12
Other diseases	4·0	...	...	4·9	0·28	0·09	...	3·7	...	5·1	0·24	5·4	...	...	1·4	0·03	0·12	0·07
Diseases due to disorders of nutrition or of Metabolism.																		
Beri-beri	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diabetes mellitus	1·5	...	0·50	0·0	0·01	...	0·03	...	...	...	...	1·3	...	...	0·2	0·00	0·04	0·01
Gout	...	...	...	0·1	0·00	...	...	...	...	...	...	...	...	...	0·0	...	0·00	0.00
Inanition	...	...	...	...	...	...	...	...	...	6·8	1·70	0·3	...	...	0·0	...	0·01	0·00
Rickets	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scurvey	...	...	...	0·0	0·00	...	...	...	...	...	...	...	...	...	0·0	...	0·00	0·00
Other diseases	0·5	...	...	...	...	...	...	0·3	...	0·7	...	0·8	...	...	0·1	...	0·00	0·00
Diseases of the male organs of generation.																		
Balanitis	...	...	...	2·8	0·09	...	...	...	...	0·2	...	0·3	...	...	0·3	...	...	0·00
Epididymitis	...	...	...	1·5	0·09	...	0·03	...	...	...	...	1·0	...	...	0·3	...	0·00	0·01
Hydrocele	...	...	...	0·7	0·04	...	...	...	...	...	...	0·3	...	...	0·6	...	0·04	0·02
Hypertrophy of the prostate.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Orchitis	...	...	...	1·5	0·05	...	...	...	...	...	...	0·8	...	...	0·9	...	...	0·03
Paraphimosis	...	...	...	0·2	0·01	...	...	...	...	...	...	...	...	...	0·1	...	...	0·00
Phimosis	...	...	...	3·1	0·14	...	...	...	...	4·9	...	0·3	...	...	0·4	...	...	0·02
Prostatitis	...	...	...	0·2	0·03	...	...	...	...	...	...	...	...	...	0·0	0·00	...	0·00
Stricture of the urethra	...	...	...	0·1	0·00	...	...	...	...	...	...	...	...	...	0·0	...	...	0·00
Urethral Fistula	...	...	...	0·1	0·00	...	...	...	...	...	...	...	...	...	...	...	0·00	0·00
Urethritis	...	...	...	6·2	0·21	...	...	...	...	...	...	0·5	...	...	1·7	...	...	0·07
Varicocele	...	...	...	0·6	0·04	...	...	...	...	...	...	0·3	...	...	0·2	...	0·01	0·00
Other diseases	...	...	...	1·0	0·05	...	...	...	...	1·0	...	0·3	...	...	0·2	...	0·01	0·01

APPENDIX XXII—*contd.*

Diseases	British Troops.										Indian Troops.						
	British officers (B. S.).			B. O. Rs.				B. O. Rs. (Wives.)		B. O. Rs. Children.		British officers (I. S.).			V. C. Os. and I. O. Rs.			
	A.	D.	Invalids.	A.	Average constantly sick.	D.	Invalids.	A.	D.	A.	D.	A.	D.	Invalids.	A.	D.	Invalids.	Average constantly sick.
Diseases of the female organs of generation.																		
Abortion	...	...	...	...	...	...	...	22·0	0·33	...	...	...	...	...	...	...	...	...
Affection connected with pregnancy and parturition and consequent on parturition.	...	...	...	...	...	...	...	29·0	0·66	...	...	...	...	...	...	...	...	...
Diseases of the ovary	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diseases of the fallopian tube.	...	...	...	...	...	...	...	4·0	...	...	...	...	...	...	...	...	...	...
Displacements and distortions of the uterus.	...	...	...	...	...	...	...	7·3	...	...	...	...	...	...	...	...	...	...
Dysmenorrhoea	...	...	...	...	...	...	...	1·7	...	...	...	...	...	...	...	...	...	...
Endometritis	...	...	...	...	...	...	...	5·3	...	...	...	...	...	...	...	...	...	...
Haemorrhage connected with parturition.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Inflammation of vagina	...	...	...	...	...	...	...	...	...	0·5	...	...	...	...	...	...	...	...
Menorrhagia	...	...	...	...	...	...	...	4·7	...	0·2	...	...	...	...	...	...	...	...
Metrorrhaegia	...	...	...	...	...	...	...	2·1	...	...	...	...	...	...	...	...	...	...
Pelvic peritonitis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other diseases peculiar to women.	...	...	...	...	...	...	...	19·0	...	...	...	...	...	...	...	...	...	...
Diseases effecting child.																		
Asphyxia of child	...	...	...	...	...	...	...	...	...	0·2	0·49	...	...	...	...	...	...	...
Injury to child	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Premature birth	...	...	...	...	...	...	...	...	...	0·7	0·49	...	...	...	...	...	...	...
Still-birth	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diseases of bones, joints, fasciae and bursae.																		
Arthritis	0·5	...	...	0·7	0·09	...	0·06	0·3	...	...	...	1·6	...	...	0·8	...	0·14	0·04
Diseases of the spine	...	...	...	0·1	0·01	...	0·06	...	...	...	...	...	...	...	0·1	...	0·04	0·00
Flat foot	0·5	...	...	0·5	0·02	...	...	...	...	...	...	...	...	...	0·0	...	0·02	0·00

Hammer-toe	...	...	...	0·5	0·04	...	...	...	...	...	...	...	...	...	0·0	...	...	0·00
Lumbago	1·5	...	...	1·1	0·05	...	...	0·7	...	...	...	1·6	...	...	1·5	...	0·02	0·04
Myalgia	1·0	...	...	4·4	0·10	...	...	3·3	...	...	...	1·0	...	...	3·4	...	...	0·08
Osteo-myelitis	0·5	...	0·50	0·3	0·06	...	0·03	1·0	...	0·2	...	0·5	0·26	...	0·2	0·00	0·03	0·03
Periositis	...	...	...	0·1	0·01	...	...	0·3	...	...	...	...	...	...	0·3	...	0·01	0·02
Rupture of intra articular cartilage.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·00	...
Synovitis	4·0	...	...	7·7	0·29	...	...	...	...	0·2	...	2·8	...	...	2·9	...	0·13	0·11
Subluxation of intra articular cartilage.	...	...	...	...	...	...	...	...	...	...	...	2·1	...	...	...	...	0·03	...
Other deformities of limbs	0·5	...	...	0·5	0·02	...	...	...	...	...	...	...	...	...	0·0	...	0·07	0·00
Other diseases	5·0	...	...	6·7	0·48	...	0·18	0·7	...	...	...	2·6	...	...	2·4	...	0·50	0·14
Diseases of the areolar Tissue.																		
Boil	1·5	...	...	7·4	0·25	...	...	0·7	...	1·2	...	1·8	...	...	5·2	...	...	0·13
Carbuncle	2·0	...	...	0·7	0·02	...	...	0·3	...	...	...	1·0	0·26	...	0·3	...	...	0·01
Cellulitis	26·3	...	...	51·2	1·73	0·03	...	9·3	...	11·7	...	25·6	...	...	23·4	0·00	0·01	0·73
Cellulitis Suppurative (abscess).	0·5	...	...	3·1	0·12	...	...	1·7	...	0·7	...	1·3	...	...	4·6	...	0·01	0·13
Other diseases	...	...	...	0·4	0·01	...	...	0·3	...	...	...	0·3	...	...	0·4	...	0·01	0·02
Diseases of the skin.																		
Acne	...	...	...	0·5	0·01	...	...	...	...	...	...	...	...	...	0·1	...	...	0·00
Dermatitis	5·0	...	0·50	2·4	0·13	...	...	1·7	...	1·0	...	2·6	...	...	4·7	0·00	0·03	0·18
Eczema	...	...	...	6·7	0·36	...	0·12	0·3	...	0·2	...	1·0	...	...	3·2	...	0·04	0·11
Favus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Herpes zoster	...	...	...	0·6	0·02	...	...	...	...	...	...	...	...	...	0·6	...	...	0·02
Impetigo	2·0	...	...	11·7	0·51	...	...	0·3	...	0·7	...	0·3	...	...	0·9	...	0·00	0·03
Ingrowing toe-nail	...	...	...	4·0	0·13	...	...	0·3	...	...	...	...	...	...	0·0	...	...	0·00
Onychia	...	...	...	0·2	0·01	...	...	...	...	...	...	0·8	...	...	0·0	...	...	0·00
Prickly heat	...	...	...	0·5	0·01	...	...	...	...	0·2	...	...	...	...	0·0	...	...	0·00
Psoriasis	...	...	...	1·2	0·10	...	0·03	0·3	...	0·5	...	0·3	...	...	0·0	...	...	0·00
Sycosis (follicultis)	...	...	...	0·7	0·05	...	...	...	...	...	...	...	...	...	0·2	...	0·02	0·01
Tinea	2·5	...	...	9·9	0·37	...	...	0·3	...	...	...	0·5	...	...	0·4	...	0·00	0·02
Urticaria	1·5	...	...	1·0	0·03	...	...	0·7	...	0·2	...	0·3	...	...	3·4	...	...	0·09
Wart	...	...	...	2·4	0·13	...	...	...	...	...	...	0·3	...	...	0·7	...	...	0·02
Whitlow	...	...	...	0·9	0·03	...	...	...	...	...	...	0·5	...	...	0·1	...	...	0·00
Other diseases	1·5	...	...	2·0	0·08	...	...	...	...	0·2	...	1·0	...	...	0·7	...	0·00	0·02
Diseases of the urinary organs.																	0·03	0·04
Calculus—																		
(*a*) Bladder	...	...	...	0·1	0·00	...	...	...	...	...	...	0·5	...	...	0·1	...	0·02	0·00
(*b*) Kidney	...	...	...	0·1	0·00	...	...	...	...	...	...	...	...	...	0·1	...	0·00	0·00
(*c*) Ureter	2·0	...	...	0·5	0·04	...	...	1·3	...	...	...	1·0	...	...	0·1	...	0·01	0·00
Cystitis	1·5	...	...	1·3	0·11	...	...	6·3	...	0·5	...	2·1	...	...	0·2	...	0·00	0·01
Haematuria	0·5	...	...	0·9	0·04	...	0·03	...	...	0·5	...	1·0	...	...	0·1	...	...	0·00
Incontinence of urine	...	...	...	0·3	0·01	...	...	...	...	...	...	...	...	...	0·0	...	...	0·00
Nephritis acute	1·0	...	...	0·3	0·10	0·03	0·18	0·3	...	0·2	...	0·3	...	...	0·1	0·01	0·02	0·02
Nephritis chronic	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·1	...	0·04	0·00
Renal colic	2·0	...	...	1·3	0·05	...	...	2·0	...	0·5	...	2·1	...	...	1·5	...	0·00	0·05
Other diseases	1·5	...	...	2·9	0·20	...	0·12	7·3	...	3·4	0·24	2·3	...	0·26	1·0	0·00	0·06	0·05

APPENDIX XXII—*concld.*

Diseases.	British Troops.										Indian Troops.					
	British Officers (B. S.).			B. O. Rs.			B. O. Rs. (Wives).		B. O. Rs. Children.		British Officers (I. S.).			V. C. Os. and I. O. Rs.			
	A.	D.	Invalids.	A.	Average constantly sick.	D.	Invalids.	A.	D.	A.	D.	A.	D.	Invalids.	A.	D.	Invalids.	Average constantl sick.
General Injuries.																		
Burns and scalds	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Effects of anti-rabic treatment.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Effects of inoculation	0·5	...	...	0·4	0·01	...	...	0·3	...	...	...	...	...	...	0·1	...	...	0·00
Heat-Exhaustion	1·0	...	...	4·9	0·13	0·15	...	...	...	0·5	0·24	2·3	0·26	...	0·3	...	...	0·00
Heat-stroke	1·5	...	...	1·2	0·06	0·06	...	...	...	...	...	0·3	...	...	0·0	0·02	...	0·00
Sun-stroke	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other injuries	1·5	0·50	...	1·6	0·08	0·31	...	...	...	0·2	...	0·5	...	...	0·3	0·07	0·01	0·01
Local injuries.																		
Abrasions	3·0	...	...	3·4	0·10	...	...	...	...	0·2	...	2·1	...	...	2·5	...	...	0·06
Burns and scalds	...	...	...	1·6	0·08	0·06	...	0·7	...	1·0	...	1·6	...	...	1·6	0·00	...	0·05
Concussions	8·4	...	...	2·7	0·14	0·03	...	...	...	1·0	...	2·8	...	...	0·4	0·01	0·01	0·02
Contusions	7·4	...	...	11·1	0·33	...	...	1·7	...	1·7	...	10·3	...	...	12·2	...	0·09	0·35
Dislocations and displacements.	2·0	...	...	1·6	0·09	...	0·03	0·3	...	0·2	...	1·0	...	...	0·6	0·00	0·08	0·02
Fractures	12·9	...	...	13·5	0·90	0·28	0·12	2·3	...	3·9	...	13·5	...	...	8·9	0·16	0·93	0·58
Sprains and strains	12·4	...	...	12·6	0·38	...	...	2·3	...	1·0	...	9·3	...	...	7·0	...	0·04	0·17
Wounds gun-shot	1·5	0·50	...	2·0	0·35	0·62	0·43	...	...	...	...	1·8	1·03	...	1·5	0·46	0·13	0·13
Wounds other	4·0	...	...	7·2	0·27	0·06	...	0·7	...	3·6	0·49	4·1	...	...	10·2	0·04	0·12	0·35
Injuries self-inflicted	...	1·00	...	0·0	0·00	0·06	...	...	...	...	...	0·3	0·26	...	0·0	0·02	...	0·00
Other injuries	1·0	...	...	2·7	0·14	...	0·06	0·3	...	1·2	...	2·1	...	...	0·7	0·05	0·13	0·0
Tumours and cysts.																		
Carcinoma	0·5	0·50	...	0·0	0·00	0·03	...	2·0	0·33	...	...	0·3	...	0·26	0·0	0·01	0·01	0·00
Cysts	1·5	0·50	...	1·3	0·04	...	...	1·7	...	0·5	...	...	...	...	0·8	...	...	0·03
Sarcoma	...	...	...	...	...	...	...	...	...	0·2	0·24	...	...	...	0·0	0·01	0·02	0·00
New growths malignant (other cases).	...	...	...	0·3	0·02	0·06	0·09	...	...	...	...	...	...	...	0·1	0·00	0·01	0·00
New growths non-malignant	...	...	...	0·7	0·04	...	...	0·3	...	0·2	...	2·1	...	...	0·4	...	0·08	0·02
Malformations	...	...	...	0·0	0·00	...	...	...	...	0·7	0·24	...	...	...	0·1	...	0·04	0·00

Poisons.

Alcohol	...	...	...	...	...	...	...	...	...	...	...	...	1·0	...	...	0·0	...	...	0·00
Arsenic	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·00
Chloroform	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other chemical poisons	...	...	...	0·1	0·00	...	...	0·3	0·33	...	...	...	0·26	...	0·1	0·03	...	0·00
Opium	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·0	...	...	0·00
Venom of insects	...	...	...	0·0	0·00	...	...	...	...	...	...	0·8	...	...	0·0	...	...	0·00
Venom of Ophidia (snake bite).	0·5	...	...	0·0	0·00	...	...	...	...	...	...	0·3	...	...	0·1	...	...	0·00
Other poisons	...	...	...	0·1	0·00	...	...	...	...	...	...	0·3	0·26	...	0·0	0·01	...	0·00
No appreciable disease	3·0	...	...	3·3	0·15	...	...	7·3	...	4·4	...	2·1	...	...	1·7	...	0·00	0·05
All other causes	1·5	...	...	0·7	0·06	...	...	0·3	...	0·7	...	1·0	...	...	1·0	...	...	0·04
GRAND TOTAL	533·5	4·96	0·92	1034·3	30·97	2·76	6·81	348·9	2·07	374·9	14·82	468·4	5·17	2·33	540·0	2·11	11·86	17·52

GIPD—M 621 A. Army—30-1-42—600.

00134323

Digitized with financial assistance from

Government of Maharashtra

on 01 February, 2020